

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Dubois & Francois' System of Driving Headings in Flery Mines.

One of the greatest problems to be solved by the mining engineer is that of rendering work in flery mines less dangerous without so materially adding to the cost of working as to preclude financial success. Efforts to trace the causes of explosions in coal mines—

shifts, thus making an advance of 5.7 feet per shift.

These figures show that the work by the Dubois-Francois system is slow, but, on the other hand, it is perfectly safe so far as explosion is concerned. It is claimed besides that it is cheaper than other methods, and it has the decided advantage over methods of wedging hitherto suggested in that the apparatus for drilling the holes and driving in

the failure of the company of which Grant was a partner it was operated by Connell, Tarr & Co., who likewise failed. The immediate neighborhood of this ruin abounds in iron ore of good quality, easy of access, and with limestone and coal limitless in quantity. It may seem strange to people of this day that the coal, abundant as it is, was not used at all, but that the immediate vicinity was stripped of its wood, the bulk of

over a crossing on the Lebanon Valley branch of their road, west of Palmyra.

British Foreign Trade.

An important discussion took place at the autumnal meeting of the Associated Chambers of Commerce of the United Kingdom, which has just been held at Sheffield, upon

they might have and disseminate accurate information upon the subject. A short time ago, as a preface to this discussion, he had distributed among the Chambers of Commerce a treatise, giving in great detail the exports and imports in this country and elsewhere. Now, he only proposed to give these facts broadly without going into detail. From the year when the statistical abstract was first published (1840) until 1872, British

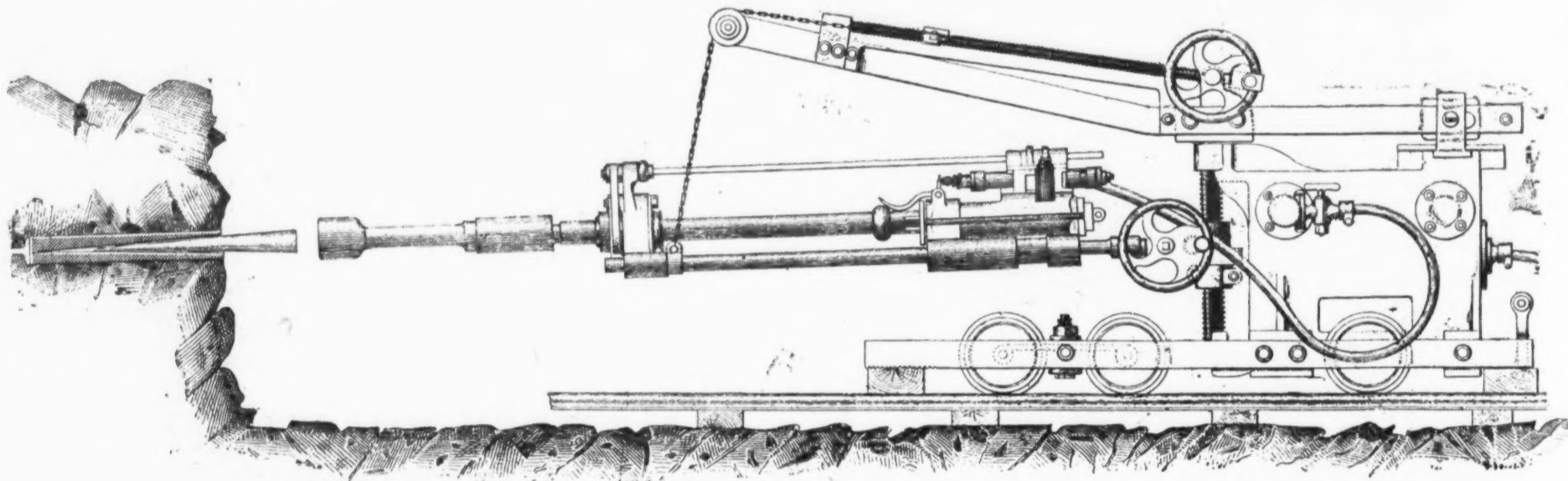


Fig. 1.—THE DUBOIS & FRANCOIS DRILL AND WEDGE HAMMER.

for example, the recent brilliant researches of Galloway on coal-dust explosions—have gone far to explain much that once seemed profoundly mysterious. A clear insight into all conditions must of course be the basis of preventive measures, which have hitherto been chiefly ample ventilation, the exclusive use of safety lamps and the enforcement of a strict police code for the examination of the mine and the exclusion of anything which might endanger its safety. One of the main causes of explosion has always been the necessity, in many cases, of driving the main headings for opening out the veins of coal for working by blasting. It is to the avoidance of this danger that the well-known Belgian engineers, Messrs. Dubois & Francois, of Seraing, inventors of the rock drill bearing their name, have devoted their energies.

In the accompanying illustrations, Fig. 1 shows the apparatus used. It consists of a compressed air drill mounted on a carriage standing on the mine track. As the cut shows, the drill of large dimensions is attached to a vertical rod, permitting a lateral motion, while a crane is used to maintain it in the inclined position chosen for the special case. This disposition makes it possible to drill a hole in any given direction and at any height. The location of the first hole, drilled in the ordinary manner, is such that the least resistance is offered to the removal of the greatest body of rock. When its depth is sufficient the drill rod is taken out and a mass of iron weighing from 60 to 80 pounds is attached to the piston rod in the same manner as the drill. A wedge and corresponding split bearing surfaces are inserted into the hole, and the drill worked as a hammer. The location of the holes and their effect must necessarily depend upon the nature of the ground, the question being whether the heading is run through rock or along the strike of a vein, and the dip of the latter (Figs. 3 and 4) show examples of the location and the succession of the holes. A series of work was done in the mines of the Marihay Company with a drill the piston of which was almost half a foot in diameter, while the striking weight was 300 pounds and the working pressure 3 atmospheres. The total weight of the carriage was 4000 pounds, which is accounted for by the size of the reservoir (shown in Fig. 1) for the compressed air. This reservoir serves to regulate the pressure of the compressed air and acts as counterweight to the drill. The rock displaced is removed while the machine is at work. The first experiment was made in a heading on a one-foot vein with hard silicious country rock. A hole 1.5 feet deep was drilled in 15 minutes (including removal of drill); the wedging required 10 minutes, or 25 minutes in all, to displace rock equivalent to a blast from a 1.5 foot hole. A heading 6.3 x 4.0 feet from the "Dure" vein to the Delyée vein was driven through country rock a distance of 59 feet in 82 eight-hour working shifts with two workmen per shift; another heading on the Many pit, running through 70 feet of schist and 50 feet of sandstone, was finished in 280 shifts, the rate of advance being 0.6 feet per shift in schist and 0.5 feet in sandstone. In the Seraing Pit a heading 277 feet long was completed in 405 shifts of 8 hours by two workmen. As an example of work on the strike of the vein, 280 feet were excavated in the "Grande-Veine" in the Flémalle in 62

the wedge is in one machine. Its value seems to be chiefly for driving headings on the strike of the narrower coal beds, while at the same time it offers to engineers a welcome means of safe advance through hard rock in extreme cases. Naturally the application of the simple principle first applied by Messrs. Dubois and Francois is not limited to their rock-drilling alone, but may be readily made use of by any percussion drill.

which was first charred for use in the furnace. The lining of the furnace presents the most perplexing difficulties to the experienced ironworker of to-day; before fire-brick was manufactured that people had a kind of stone which seems to have increased in durability and hardness as the heat was intense. The interior is so well preserved that nothing but the removal of support will cause it to fall, being strongest and most im-

the decline of the foreign trade of Great Britain. The topic was introduced by a resolution from the Sheffield Chamber of Commerce, "that in the opinion of the association it was desirable that a Royal Commission or a select committee should be appointed for the purpose of making an inquiry into the present condition of British foreign trade; and that such commission or committee should investigate the causes of the

trade progressed with great rapidity. There were comparatively few fluctuations. During that period there were wars and rumors of war, revolutions and famines, and all those untoward events which during any long period of time must occur; but, notwithstanding that, British trade increased most prosperously. But since 1872, exactly the opposite state of things had prevailed. Since that year a very great decline had taken place. Their exports, which in 1872 amounted to £256,000,000, had in 1877 sunk to £198,000,000. And for the first seven months of the present year, ending with July, there was still a decrease of £1,760,000. While this immense diminution had been taking place, a diminution which if continued would inflict great misery upon nearly all the manufacturing towns of England, their imports had been increasing. A paper had been published only a few weeks ago by her Majesty's Commissioners of

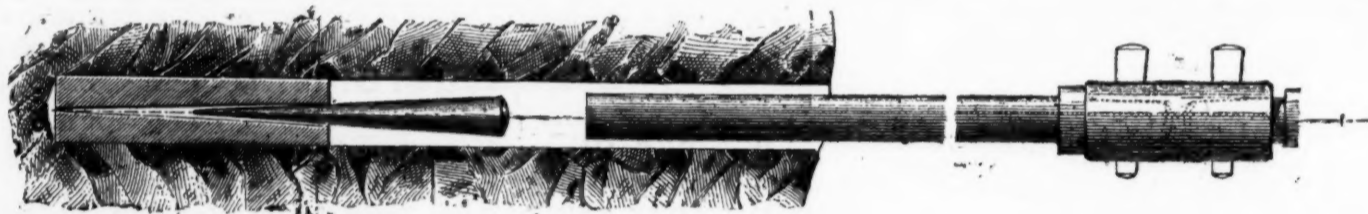


Fig. 2.—HAMMER AND WEDGE.

With so simple a means at their disposal we would consider the firing of a single shot in a flery mine a criminal act of recklessness, even though the rate of advance be slow when compared to the results achieved by modern methods of mining. The wedging down of coal by machinery is not a novel proposition, but none hitherto attempted is so simple and so generally applicable.

pervious to action of pick where fire-brick would have been weakest. Will not some of the scientists of Butler show us the quarry? * * * Much of the metal there reduced was molded on the ground into skillets, kettles, grates, &c., which found a market at the furnace, the purchasers being from the sparsely settled region for 25 miles in all directions. We have been told that many of the kettles, pots, &c., manufactured here

decline of British exports." The member from Sheffield, Mr. Brittain, who introduced the motion, said he thought he must assume that all members of the association were impressed with the necessity that the mercantile community should be very well informed as to the condition of our trade. It was desirable that all dangers by which they were menaced should be clearly foreseen, and measures taken to avert them; but while all

Customs which threw some light upon the question. According to that paper manufactured articles were imported into England in 1873 to the value of £35,000,000, and in 1877 to £46,000,000, so that while their own sales had been so rapidly diminishing, purchases of manufactured articles had been quite as rapidly increasing. That was not all. Turning from the statistics of their own foreign commerce to those of foreign nations, they found a very forcible illustration, at least an explanation as to where some of their trade had gone. Only a fortnight ago the statistics of the exports of the United States for the fiscal year ending June 30, 1878, were published. The increase in exports from the United States during the last year had been \$91,000,000, and in the year preceding \$64,000,000, so that in two years the exports from the United States of domestic produce had increased to \$155,000,000. He went on to say that there was scarcely a manufacturing country in the world that had not either been maintaining its position during the last few years, or had been rapidly increasing its exports, while their own exports had rapidly fallen off. He also reviewed at some length, and with considerable severity, some of the tables of statistics which had been going the rounds giving too favorable a view of their traffic. It had been worse than they represented. He himself knew the facts. He did not want this Royal Commission for his enlightenment, but that the real facts might go out with an authoritative endorsement which would compel attention and action. Very naturally this motion thus presented drew forth considerable opposition, in which conflicting views of free trade and tariffs were mixed up. The effort was also made to show that hard times were with them they were no worse than in other countries. The resolution finally prevailed, though by a small majority. It is hardly likely that any Royal Commission will come of it, but a good deal of respectable, not to say authoritative, testimony as to the condition of British trade has already been the result.

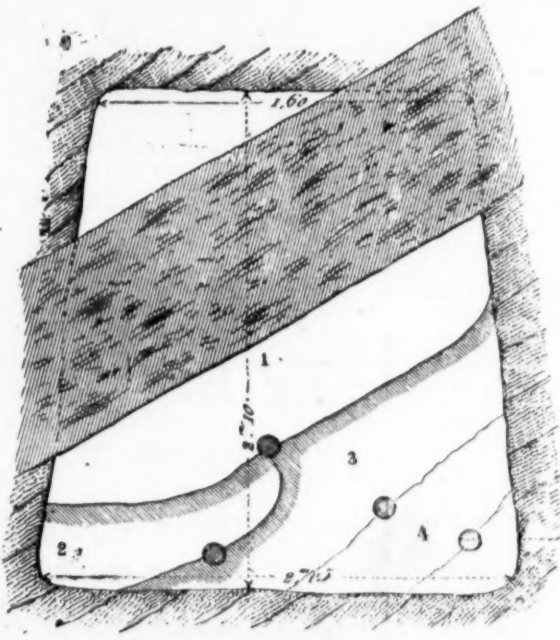


Fig. 3.—SECTION OF HEADING ON VEIN.

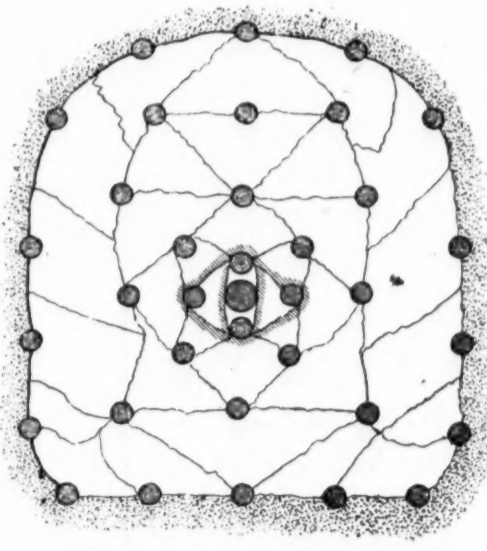


Fig. 4.—SECTION OF HEADING IN ROCK.

Hancock Iron Works.—The New Cumberland (W. Va.) Independent says: In Butler District, on King's Creek, about one-half mile below the old Mahan mill, stands a circular ruin whose history is suggestive not only of the march of time, but also the improvement in reducing iron ore and the subsequent processes by which it is rendered useful. This furnace was built during the last century by a man named Grant. After

are yet preserved in those houses where the occupation has been continuous, and that the metal is of superior character. The residue of the metal, crude and manufactured, was transported over the hills to Wellsburg, the home and place of business of John Connell and Peter Tarr, owners of the manufactory.

The Reading Railroad Company is erecting a new iron bow-string bridge, 64 feet long,

agreed on this question, he doubted not there would be some difference of opinion as to the means which should be taken for protection. Before he asked for the votes of the association, it would be necessary for him to give some justification of the motion. The Sheffield Chamber of Commerce thought that one of the means by which great good might be accomplished would be the appointment of a committee or commission in order that

The threatened war between the Argentine Republic and Chili has not yet broken out, but a peaceful solution of the difficulty seems improbable. It is expected that Peru and Bolivia may take a part in the contest should war be declared, the former on the side of Chili.

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SEE PAGE 6.**Phelps, Dodge & Co.,**
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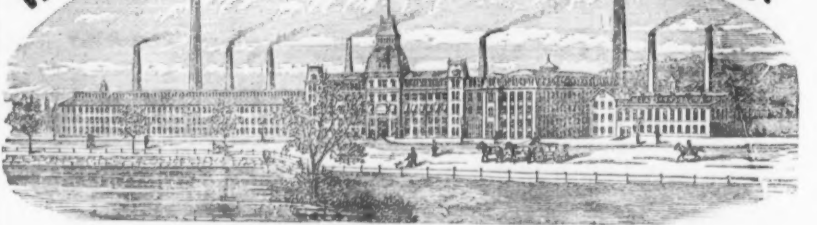
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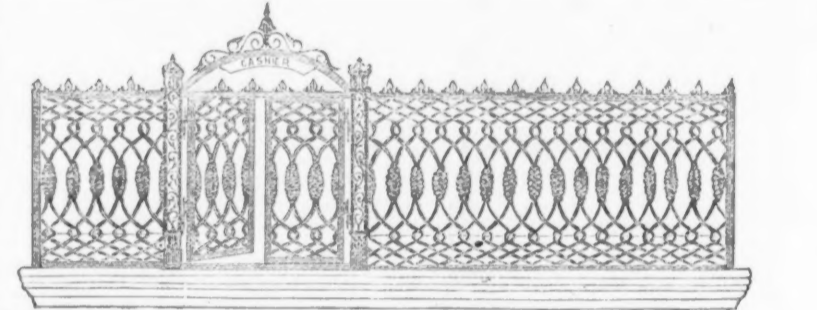
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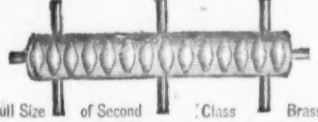
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Condition of European Labor and Commerce.

We have received another batch of reports from the State Department, from which we extract such portions as will be likely to interest our readers.

Mr. Catlin, United States Commercial Agent at La Rochelle, France, reports, under date of August 13th, that at a convention held on the 4th, under the auspices of the Agricultural Commission of the Arrondissement of La Rochelle, the president of that body urgently appealed to his hearers to substitute, as far as possible, agricultural machines and implements for hand labor.

Monsieur E. Boncasse, president of the Agricultural Society of La Rochelle, (and principal of a school of farming near this city) at the same meeting still more urgently pointed out to the farmers the necessity of replacing the worn-out methods of their ancestors by modern agricultural improvements.

"In view of the above facts," the consul says, "it is probable that a great impetus will be given to the demand in this district for agricultural machinery—indeed, an increased demand is already reported by the two houses concerned in the sale of such wares in this city, and I hasten to acquaint the department with the fact in order that our American manufacturers may have an early opportunity to compete, and derive any possible benefits resulting therefrom."

Mr. Cooper, Consul at Glasgow, reports that the rate of wages now paid is about 7 per cent. higher than it was five years ago (except that of miners, which has declined 100 per cent.), but it is now declining, and if the present stagnation in trade continues will soon fall even below former rates. There is yet no corresponding decline in the cost of living, which to the lower classes is about the same as in the States. Meats and fruits are quite beyond the reach of those classes, being far dearer than they are in America. Vegetables of all kinds are also 100 per cent. dearer. Rent, clothing, bread and sugar, tea and coffee cost about the same in Glasgow as in New York. Whiskey, which is considered a positive necessity by the great mass of laborers here, costs about 300 per cent. more than it does in America, and with beer, which is comparatively cheap, and as unwholesome as cheap, absorbs the larger portion of the laborer's earnings. There are eleven banks of issue in Scotland, with their branches, each working under its own special charter. The circulation of each bank is unrestricted. It is only required to redeem its issue in coin, and to hold an amount of coin equivalent to the excess of actual circulation over the authorized circulation. Only about 5 per cent. of the circulation is coin, four-fifths of which is silver. Paper is universally preferred, and gold coin never called for or desired except for special purposes. Laborers of all classes are paid off in silver, which is in constant demand for change and sometimes commands a small premium over gold or paper, owing to the fact that a pound note is the smallest denomination issued.

Mr. Richmond, United States Consul at Cork, Ireland, gives the following as the ordinary wages paid to laboring and mechanic classes of Cork and vicinity:

Agricultural laborers, per day, 48c.; boatmen, 72c.; coal heavers, machinists, gas fitters, and hakers, \$1.00; masons, shoemakers, painters, and joiners, \$1.21; engineers in tug boats, per week, \$12.16; firemen, \$6.63; sailors, \$6.07. Laborers on public works, per day, 48c. to 60c.; boys, 24c. to 40c.; excavators, quarrymen, 73c. Guards on railways, per week, \$4.38 to \$7.29; head porters, \$4.3 to \$4.86; porters, \$3.40 to \$3.89; engineers, per day, \$1.21 to \$1.70; firemen, 60c. to \$5.1; cleaners and steam raisers, per week, \$2.92 to \$4.38; gaugers, \$4.13; millmen, \$3.40. The gaugers and millmen also receive a gratuity of \$4.86 at Christmas. These men have the charge of the repair of the permanent way, and in the summer of 1877 struck for a slight advance on the above pay, but after holding out for some two months were obliged to come back at the old rates.

The food of the above classes, with the exception of engineers and guards, is made up of a selection from tea, milk, bread, oatmeal, potatoes, dried fish and, among the poorer people, a coarse Indian meal, which is used instead of oatmeal. The cost of this subsistence varies slightly in different localities, the highest, 14c. per day, being about the expense in Cork, Queenstown and their neighborhood. Rent and clothing cost about \$35 a year, making a total of about \$85. The mechanic pays something more for a better lodging, but in other respects his living is the same as the laborer. The cost of living is believed to have increased about one-sixth in the last five years, and wages have advanced in about the same proportion.

Trade in this district is much depressed, as it has been for some years past, and many failures have taken place among the grain and dry goods merchants. Cork is the principal port in the south of Ireland for the importation of wheat and Indian corn for distribution throughout the district for distilling, feeding and milling purposes. Transactions in these grains are nominally conducted for cash, but in reality short notes are usually received for the cargoes. The distilling of whiskey is a large business, the last accessible report showing an export for the year of 3516 puncheons and 6931 hhd.; this is also sold on short time. The district is, however, essentially an agricultural and stock-raising one, and large quantities of pigs, sheep, cows and calves are bought of the farmers for cash and sent over to the English markets. Butter to the amount of nearly 500,000 firkins passes annually through the butter exchange of Cork and is sent to England and Scotland, the farmers usually selling their prospective crops for a cash sum in the beginning of the season, leaving a margin for the risk taken by the buyer, which has proved very profitable. All the branches of trade and industry in this district are seriously affected by the falling off of business with the United States.

Mr. Smith, Commercial Agent at Nottingham, England, says: There is great complaint here, as in all parts of England, of the very depressed state of trade. Manufacturers complain that their business is small and falling off, and there is a general cry of hard times. The employers of labor claim that they are losing money or doing business

at so small a profit as to make it necessary to reduce the wages of laborers. The latter are not disposed to submit to reductions. The consequence is a great uncertainty as to the future. In this district there is much talk of the necessity of reducing wages, especially in the hosiery factories. The manufacturers complain that the competition is so sharp, especially from Germany, that a reduction of wages here is absolutely necessary. Of course the laborers resist. There has not yet been any decisive action on the part of the employers, but there is a very uneasy feeling on all sides. Shippers have been hoping for the revival of business with the United States, and they are still looking to that country for the beginning of better times. Up to this time there has been no increase of orders from our country, which is a liberal buyer in prosperous times.

The following shows the average wages of workers in the lace and hosiery trades, those being the principal industries here: Men (piece work) per week, 45/ to 77/; second class workmen 20 per cent. less. Young women 11 per week; girls (half-timers) 4/6; good fitters, 43/ to 49/. (The prices of provisions generally are about the same as those given in previous reports from other English districts.)

Mr. McMillan, Consul-General at Rome, gives the following information in relation to his district:

From 13 to 30 cents, including lodging but not board, is stated to be the average daily wages paid to agricultural laborers for the entire district. Women are also largely engaged in field labors, with wages from 6 to 11 cents per day, including lodging; in some localities, by the year, at from 90 cents to \$1.50 per month, including board and lodging. Throughout the district, children from 12 to 14 years of age working with men and women in agricultural pursuits, receive the wages usually allowed for women. In a report made by the Chamber of Commerce of Rome on the condition of the laboring classes in the manufacturing, 30 cents for men, 15 cents for women, and 2.5 cents for children is stated to be the average daily wages paid to this class of laborers in Rome, not including board and lodging; the same report gives 20 cents for men, 10 cents for women, and 2.5 cents for children for the remainder of the province. The average day's labor consists of 10 hours, with one-half hour for dinner in winter, and 1½ hour for dinner and repose in summer.

The following are the wages paid for hands by the Roman Railway Company: Engineers, \$15 to \$20 per month; firemen, \$8 to \$9; ordinary hands, \$6; overseers for ordinary hands, \$9, including lodging.

The cost of living for what may be termed the necessities of life to agricultural laborers of this district may be calculated at from 6 to 10 cents per day. The ordinary laborer's fare consists of coarse bread and cheese, with raw onions, in the morning; at midday a substantial soup of vegetables and macaroni, with pork fat or olive oil, or a dish of *potenta*; and bread and cheese, with onions or salad, as the case may be, in the afternoon and evening, sometimes varied by stockfish. On very rare occasions only mutton or goat's meat and wine are indulged in. The cost of living per day to mechanical laborers in this city is variously estimated at from 15 to 25 cents.

A considerable advance in wages paid to agricultural laborers and in the cost of living followed immediately on the annexation of this district to the kingdom of Italy in 1870, but they have not varied materially during the past few years. Dating from 1870, wages paid to agricultural laborers on that portion known as the Agro Romano have increased 40 per cent. Other portions of the district of Rome give an increase of from 20 to 25 per cent. The increase in wages paid to mechanical laborers in this city since 1870, with few exceptions, is slight, and bears no proportion to the increased cost of living. Immediately after the events of 1870 prices of the principal articles of consumption advanced 25 per cent; during the past five years they have not varied sensibly. When Rome became the capital of Italy, owing to the great influx of speculation, government employees, and strangers from all parts of Italy, rents advanced from 75 to 100 per cent., where they still remain.

As regards the commercial condition of Rome, it cannot be said to be prosperous, although a slight improvement has been manifest during the present year; and exports to the United States have been more active than for several years back. Although Rome is not a great manufacturing center, as compared with the industrial importance of cities of its size in Northern Europe, it is one of the principal markets of Central Italy. Its principal articles of export to foreign countries are raw wool, horned cattle, cheese, cereals for seed, raw hides of small animals, such as lambs, kids and hares, an earth for cement known as Pozzolana, statuary, paintings, mosaics, cameos and jewelry, and an infinite variety of minor works of fine art. The limited manufactures of woolen, cotton and silk are nearly all absorbed at home, or in the surrounding rural districts; the same is true of manufactures of boots and shoes, carriages, fire-arms and machines and machinery.

Rome, from its historical associations as the principal seat of classical study of the fine arts, as the capital of Italy and the seat of the Papacy, attracts a large floating population of all nationalities, constantly renewed, whose expenditures form a very considerable source of wealth that thus far has not been noted in any statistics; this is especially true of mosaics, cameos and jewelry, all of which are among its most flourishing industries, and such other works of art as may be carried away directly by the purchaser without having recourse to the ordinary means of shipment. Most European nations have established institutions for the study of the fine arts in Rome, while the United States are represented by 17 sculptors and 18 painters, whose artistic productions are destined almost exclusively for our country.

The chief articles of import into Rome from foreign countries are dry and smoked fish, petroleum, spirits, sugar, coffee, spices, colored marbles, cast iron and steel, hardware, hard coal, coke, porcelain, pottery, glass and crystal, medicinals, chemical products, paints, kid

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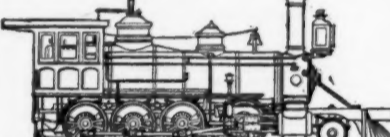
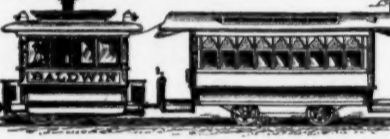
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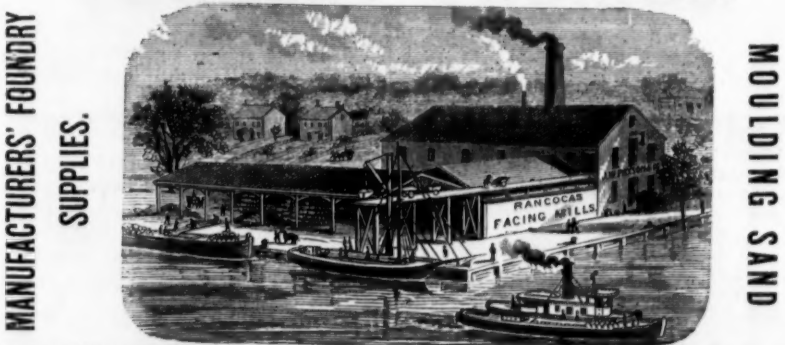
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gloves, woolen, cotton, linen and hemp and their respective manufactures, paper, books, machines and machinery, haberdashery, gold, silver and precious stones. Imports from the United States consist almost wholly of petroleum, cotton goods, sewing machines, and agricultural implements and machinery. I have not been able to obtain trustworthy figures of the imports into Rome from the United States, as they are only in part received direct from New York via Glasgow and Leghorn per Anchor Line steamers, and in part through the ports of Genoa, Civita Vecchia and Naples. Paper money is a legal tender in Italy for all payments except customs, and is of one uniform type throughout the kingdom. The smallest denomination is 50 centimes (5 cents), and the highest 1000 lire (\$100).

Mr. Noble, Consul at Turin, gives the rate of wages of his district as follows: Males, daily, 9 months, 9 hours per day, without maintenance, 24 cents; 9 months, 12 hours per day, without maintenance, 40 cents per day; say 3 months in harvest time, 15 hours per day, without maintenance, 60 to 70 cents per day. Some proprietors in harvest time pay 40 to 50 cents per day, with a bottle of common wine and a dish of soup. In winter time some laborers are paid 30 cents per day, without maintenance. Youths 14 to 16 years of age are paid from \$20 to \$24 per annum, with board. Females, about one-half of the above rates of wages. There are field hands who receive \$18 per annum, with board. The Great Northern railways, now run by the national government, pay about as follows: Males, ordinary laborers, are paid from 50 to 60 cents a day; engineers, \$30 to \$42 monthly, besides a small interest on the economy made on coal (in the quantity fixed by the railway authorities and based on the distance). On the average this bonus amounts to \$12 monthly. Conductors' wages range from \$240 to \$400 per annum; other employees on trains, \$200. Station masters vary from \$300 to \$1000; supervisors of goods, \$360 to \$480; other employees, according to grade, \$240 to \$300. The employees on lines run by the government who are paid by the month or year are subject to a rebate, which is put into a common pension fund, so that after a certain number of years of continual and faithful service every one is entitled to an annual pension based on the amount of salary paid him while in active service. In case of accident or death when on duty the widow receives a subsidy. Silk spinners, females, are paid from 18 to 24 cents per day of 13 hours, with lodging in common, wood and light. Mechanics, males—brick and stonemasons, carpenters, smiths, 50, 60, 70, 80 cents and \$1 to \$1.20 of 12 hours, according to the season of the year; upon an average 65 cents per day.

Cost of living: Agricultural laborers spend 16 cents, others 20, daily; females, a shade less, 15 to 16. The agriculturist, both farmers and laborers, lives very economically. Adjoining many country dwellings, barns, 2 stories high, are built, in the upper part of which is stored the fodder; in the lower story are the stables for horses and cattle, in which male and female laborers and their children are lodged; there is also a kitchen adjoining the stable where the laborers cook their food in common. During the past five years there has been a gradual advance of at least 15 per cent. in the rates of wages and cost of the necessities of life.

Commercial and manufacturing affairs are at present and have been for five years past quite unsatisfactory; indeed, exportation of manufactured articles have almost ceased, matters going from bad to worse. Enterprises in trade, manufactures, mining, when in the hands of Englishmen, Germans, Frenchmen and other foreigners in this country, seem to result in a greater success than when they are controlled by the sons of the land. The laborer in this country being poorly nourished, does not, in my opinion, perform in a given time as much labor as the Englishman or the North American, who are better nourished. One of the signs of the times here is that during the past five years there has been a gradual increase of suicides, larceny and of beggars. There is such an increase of taxation, with a less demand for labor, so many drones, that is to say, military men, priests and an army of tax gatherers, that the substance of the people is lessening day by day, and misery from want of food and proper raiment is daily increasing.

Reclamation of Flooded and Sterile Lands.

In a paper lately read before the National Agricultural Congress, Mr. G. B. Northrup gave the following account of the reclamation of flooded and beach sand lands:

In 1843 the draining of the lake of Haarlem, in Holland, was completed. The lands thus recovered have since been sold by the government for nearly \$3,500,000, or about \$80 per acre. The success of this grand experiment has prompted others, like the draining of the Ruid Plas—a lake covering nearly 12,000 acres—and the great work now progressing to drain an arm of the Sheld, which will recover some 35,000 acres. Encouraged by the results by these enterprises, the Netherlands engineers now advocate the stupendous project of draining the great salt-water basin of the Zuyder Zee—an inland sea which covers 1,300,000 acres. The Italians have nearly completed the work of enlarging and deepening the tunnel cut by the Emperor Claudius to drain Lake Celano. This tunnel, more than four miles in length and costing over \$6,000,000, will recover for agricultural occupation 42,000 acres of most fertile land.

An extensive experiment for the reclamation of beach sand lands was tried most successfully nearly a hundred years ago along the coast of the Bay of Biscay. These sand hills, or dunes, as they are called, stretch over a hundred miles between the rivers Adour and Gironde. These dunes, ranging from 180 to 320 feet above the level of the sea, are composed of white silicious sand rounded and reduced to minute grains by trituration. These grains are still too heavy to be borne aloft by the winds and scattered afar like the ashes of volcanoes. On the Atlantic shore of France the prevailing and most violent winds are from the west and southwest. Hence, at low tide

the sands dried by the sun and the wind are driven as along an inclined plane up the slopes which descend seaward, moving inland, have caused great desolation.

Our Atlantic sand plains were once covered with forests. The now bare white sand hills of Provincetown were described by the Pilgrims, on their landing there, as well wooded. The sand hills on the coast of Prussia were formerly wooded down to the water's edge, and "it was only in the last century," says George P. Marsh, "that in consequence of the destruction of their forests, they became moving sands." King Frederick William I., when in pressing need of money, sold the forests of the Freische Nehrung for 200,000 thalers and the trees were all felled. Financially the operation was a temporary success, but in the lasting material effects the state received irreparable injury, and would now gladly expend millions to restore the forests again. The dunes of the Netherlands were clothed with trees after the Roman invasion. The old geographers speak of vast forests extending here to the very brink of the sea, and the drifting coast dunes have assumed a destructive character in consequence of the improvidence of man. The history of the dunes of Michigan is the same. Forty years ago, when that region was scarcely inhabited, they were generally covered with a thick growth of trees, and there was little appearance of undermining and wash on the land side, or of shifting of the sands, except where the trees had been cut or turned up by the roots.

The sand dunes of Denmark cover over 160,000 acres, those of Prussia 110,000, those of the single province of Gascony, in France, over 200,000, and in all Europe the drifting sands, according to Pannewitz, cover 7,000,000 acres. There is no question that most of this waste is capable of reclamation by simple tree planting, and no mode of physical improvement is better worth the attention of civilized governments than this.

This is a subject of practical interest to us because we have along our coast as at Cape Cod, in Connecticut, at some points in New Jersey, and other Atlantic States, on the shores of Florida, on the gulf coast, on the eastern shore of Lake Michigan and elsewhere, long tracts of drifting sand that have done serious local damage. To stop this extension, considerable expenditures have already been made in several States to cover their surface with a vegetable growth. But this reclamation of barrens and sand dunes has been carried on most extensively and successfully in Europe. Nearly a century ago Bremon tier published a memoir on the reclamation of sand dunes. Under the patronage of the French government, he successfully introduced the planting of the maritime pine along the Atlantic coast of Gascony. These plantations have been perseveringly continued from that time to the present, and now cover over 100,000 acres in the single district between the rivers Adour and Gironde. Not only has this wide area been reclaimed and made productive soil, but a still greater extent of fertile land has been rescued from the destruction threatened by the advancing sand hills.

In planting the dunes, a barrier along the shore was found necessary at first to protect the young trees from the rolling sands, which otherwise would bury them. A double line of paling was erected parallel to the shore, and a hundred meters from high water mark—the second line being a hundred meters further inland. This paling is made of planks, sharpened at the lower end, and driven into the sand. Spaces enough to pass through to bank up equally on both sides, and relieve somewhat the force of the wind by allowing it to pass through these openings. As the paling is covered by the sands the planks are raised one at a time. A movable frame with a long lever, and mounted on runner, so that it can be slid along the top of the fence, and having pinchers and a chain is easily carried and operated by one man.

The total cost of planting and protecting the pines has sometimes been as much as \$40 per acre. The timber of this plantation has long been a source of profit, affording both resin and wood. France now draws an annual revenue of 130,000 francs from the resinous products of these forests. But in this case the greater profit comes from the consequent protection of the adjoining country from the encroaching sands, which had formerly sterilized fertile regions and buried thriving villages. M. Samonias says that "in all France nearly 1,000,000 acres (400,000 hectares) of desolate lands, supposed to be doomed to everlasting sterility, have been reclaimed, and these savage deserts are now stocked with maritime pines which will become for the country a fruitful source of wealth, and supply some day the wants of the whole of France."

Signal Service on the Lakes.—The Buffalo Courier of Thursday says this good word for the Signal Service and its value to shippers during the recent storm on the Lakes: With the warnings thus far extended and timely it was almost impossible for a vessel to put out to sea, or to remain long on her course, without seeing the danger signal. And our lake captains have learned, when they see it, to regard it. It is probably within the truth to say that property enough was saved last week, as a direct result of the signal system, to pay the total expenses of the entire service for two years. A signal service to commerce, truly, in more senses than one.

In an address on the essential elements of a liberal education, recently delivered in the "University Convocation in the State of New York," Dr. Buchanan said: "In neglecting industrial education we have produced a race of soft-handed, soft-muscled men, who struggle to escape man's duty, useful production, and to live at others' expense by the innumerable methods of financial stratagem. The reign of fraud will never cease until each man is taught that life presents this sharp alternative—useful production or the life of a vampire. He who has attained manhood without being trained to useful production, may justly utter maledictions against parents and schools for having blasted his life and deprived him of the only solid foundation of honor and prosperity."

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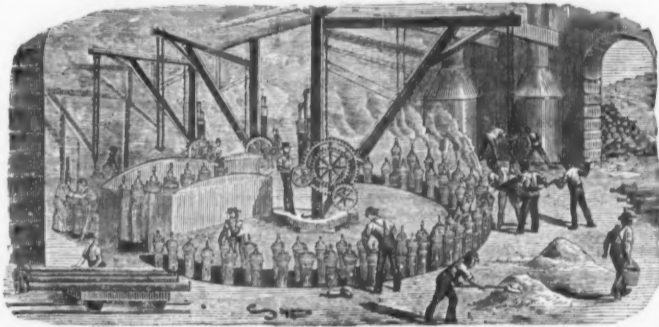
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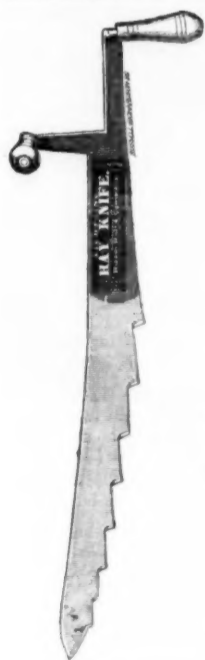
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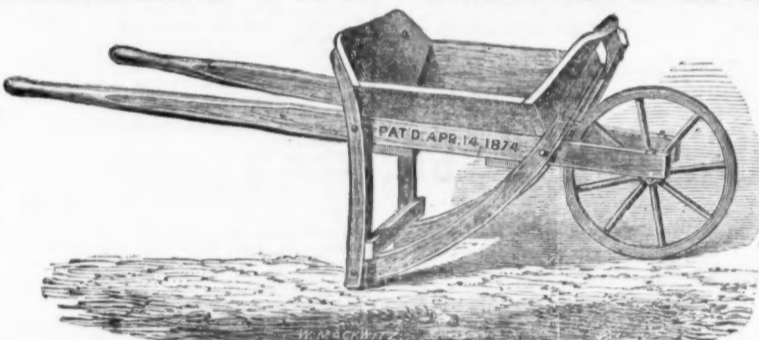
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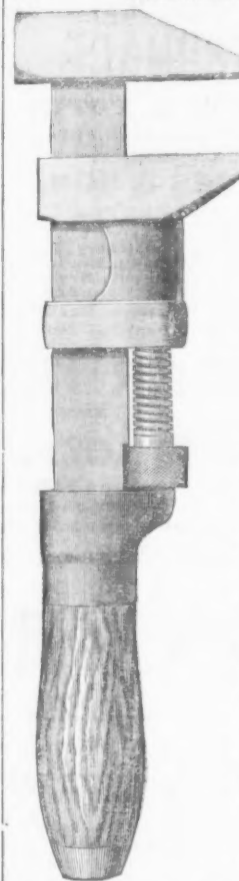
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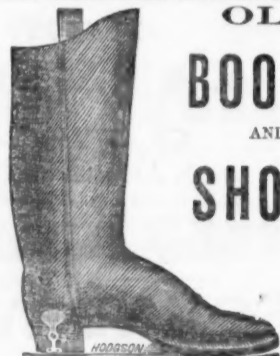
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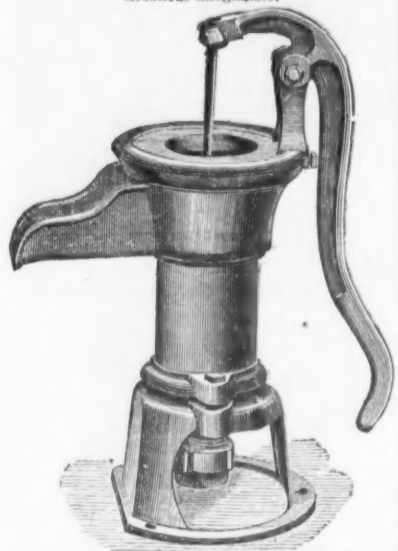
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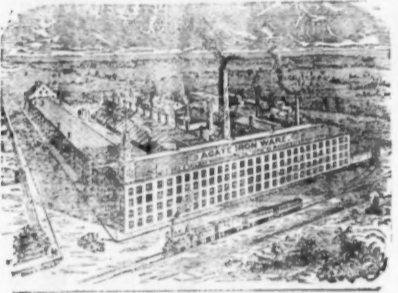
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Manufacturers of all styles Plain and Ornamental Butts,

LOOSE PIN REVERSIBLE,

Cast Fast & Loose

Drilled and Wire Jointed.
Japaned, Figured Enameled, Nickel Plated
and Real Bronze Butts. Also a full line of

IRON & BRASS PUMPS,

Station, Well, and Force Pumps, Yard, Drive
Well, Garden Engine and Steam Boiler Pumps,
Hydraulic Rams, etc., and all with the most modern
improvements.

Centennial Spring Hinges.

This Hinge has two flat coil
springs, very powerful. It has a heavy
solid pin, giving much less fric-
tion than a hollow pin. It has
broad, solid bearings in the knuckle,
which do not wear down readily and
let the door sag. It is Fast Joint,
therefore can be used for either right
or left hand. By actual test it has an
average of 50 per cent. more power
than other Spring Hinges in common
use of same size.

Fine Castings a Specialty.

NEW BRITAIN, CONN.

Warehouses,

98 Chambers St., N. Y.

67 Kilby St., Boston, (Pumps.)

Hendon & Deakin, 507 Com-
merce St., Phila. (Butts.)

Send for Illustrated Catalogue and
Price List.

**THE IMPROVED
HOWE SCALES**

In Competition with the World at Philadelphia, 1876.

TWO FIRST MEDALS, and TWO DIPLOMAS OF MERIT

The following are the points that the Judges officially announce as the basis of their award of the
highest honors to the Howe Scales:
1st. For their Protected Bearings (the Howe is the only Scale with Protected Bearings), which makes
the Scale **DURABLY ACCURATE.**
2d. For their Strength.
3d. For their Simplicity.
4th. For their Economy in Construction.
5th. For their first-rate Material and Workmanship.
6th. For their various original Improvements and Adaptations (which being patented are exclusively
possessed by the **HOWE**).

The Improved Howe Scales

MADE BY THE

HOWE SCALE COMPANY, of Rutland, Vt.,

Are Guaranteed Superior to all others.

For Plans, Prices and other information, address,

A. M. GILBERT & CO., 95 to 101 Lake St., Chicago; 116 Main St., Cin-
cinnati; 157 Water St., Cleveland, O.; 612 N. Third St., St. Louis.

PRIEST, PAGE & CO., 325 Broadway, New York.

" " " 213 Market St., Philadelphia.

" " " 145 Franklin St., Boston.

" " " 63 Wood St., Pittsburgh.

M. C. HAWLEY & CO., 201 & 203 Market St., cor. Main, San Francisco, Cal.

" " " Sacramento, Cal.

FROTHINGHAM & WORKMAN, Portland, Oregon.

" " " Montreal, Canada.

A. F. PIKE,
East Haverhill, New Hampshire,
Manufacturer and Wholesale Dealer in

**Scythe, Axe, Knife and Hacker
STONES.**

**LETOILE,
UNION,
PREMIUM,
DIAMOND GRIT,
WHITE MOUNTAIN,
INDIAN POND** (red end-
stones gotten up or labeled in
any style desired. Price and
quality guaranteed.
Our Stones are of good keen
edge and will not glaze.

**METALLIC
SHINGLES.**

We call the attention of all par-
ticularly interested in roofing, and the
owners of large buildings, to the
above article. It is superior to
slate, cheaper, fire proof, about one-fourth the weight,
lays much closer, therefore is storm proof, cannot
crack, etc. Any carpenter can put them on. Send for
description and Price List to Iron Clad Manu-
facturing Co., 50 Greenpoint Av., Brooklyn, L. I.
P. O. Box, 2528, N. Y. City.

New Patents.

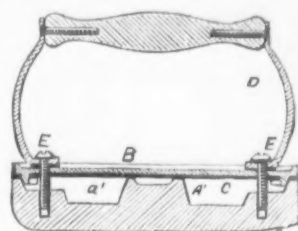
We take the following abstract of new
patents, recently issued, from the official
record:

MACHINE FOR FLANGING BOILER HEADS.

To L. Campbell and James F. Richards,
Pittsburgh, Pa.—June 25.—The heated plate
is secured in a revolving clamp, and its edge
is bent upward against a revolving resisting
roller by a vertically-moving revolving for-
mer. The former and resisting roller are
peculiarly constructed, and each may be ad-
justed either vertically or horizontally, as
required. The mechanism for vertically
feeding the former is an improvement on
that described in Letters Patent No. 201,325,
issued to patentees March 19, 1878, and the
improvement consists in notching the loose
cam-collar and in pivoting to the side of the
arch-piece a catch bar, which normally
gravitates toward said collar and enters its
notch, holding the collar stationary, and
permitting the pawl on the fixed collar of the
feed screw to engage at certain intervals
with the notched head of said screw. The
upward movement of the former is con-
tinued until the catch bar is withdrawn
from the notch in the loose collar by a pawl
operated by a stud on the fixed collar of the
former shaft.

1. In a flanging machine, the combination,
with revoluble table F and a rest, e, for the
plate, of the vertical pressure roller c', hav-
ing positive independent motion, and a re-
volving former, c, having positive indepen-
dent motion and capable of vertical feed.

A, having a dead-air space or chamber, a',
and a detachable metallic cap, B, a lining of
asbestos, C, forming a ceiling to said air
chamber and a non-conducting joint between
the body and cap.



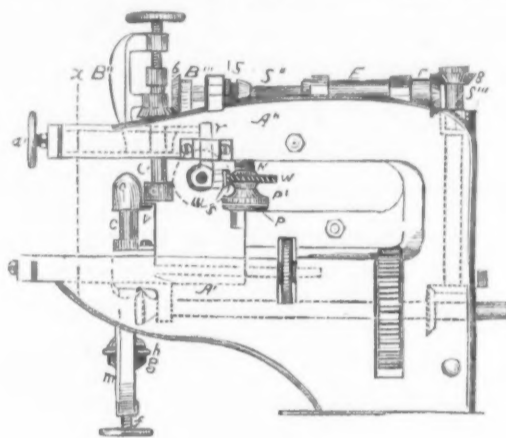
2. The combination of iron A, having air
chamber a' and central post A', detachable
cap B, asbestos lining C, handle D, screws
E E and washer.
205,171.—Patlock.—Wilson Bohannon,
Brooklyn, N. Y.—June 25.

205,204.—Reversible Latch.—Milton C. Niles
and Sidney S. Niles, Oak Park, Ill.—
June 25.

By a screw in the face plate the talons are
thrown back to disengage them from the
knob-shank. They are then drawn forward
until the latch bolt projects enough to be
turned, so as to adapt it for a right or left
hand door.

205,275.—Time Lock.—Thos. F. Keating,
New York, N. Y.—June 25.

A disk similar to the combination lock
disk is rotated by the time mechanism. The



2. In a flanging machine, the combination,
with revolving table F and a rest, e, for the
plate, of the vertical pressure roller c', hav-
ing positive independent motion and capable
of lateral adjustment, and a revolving for-
mer, c, having positive independent motion
and capable of both vertical and lateral ad-
justment.

3. In combination, a revolving former, c,
and a vertical pressure roller, c', having its
periphery axially inclined, the pressure
roller c' being so inclined, substantially as
described, as to bear upon a plate only on
that side of its axis next to the former c.

4. The combination of presser foot P',
with its shaft S', collared and grooved as
shown, threaded sleeve k, shears A'', splined
gear 11, pinion 12, gear 14, spur 15 and
shaft S''.

5. The combination of sleeve k, shears A'',
worm-wheel W, worm shaft w, plate s,
sliding bearings r and brackets t.

6. The combination of notched loose collar
h, fixed collar g, with the described stud on
its upper surface, pivoted pawl n, having de-
tent o, pivoted catch bar m, having notch
for the detent, with the shaft C, former c
and notched-headed feed screw f.

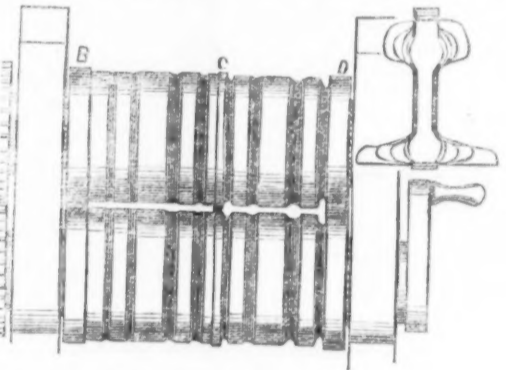
RE-ROLLING OLD RAILS.

To Thomas Glaze and William Westwater,
Pittsburgh, Pa.—June 18.—1. The herein-
described improvement in the art of reduc-

fence bar of the permutation lock projects
over the time disk, so that the lock cannot
be operated until the notch in the time disk
allows the fence bar to drop into the disks.

The following trade-mark was issued
June 18, in the United States Patent Office:
Axes.—Kloman, Park & Co., Pittsburgh,
Pa. The arbitrarily-selected title or word-
symbol "Iron City," used in connection
with the words "John & Co."

We are indebted to Mr. A. N. Parlin,
treasurer of the Magee Furnace Company,
for a number of castings showing what good
work can be done with cast iron when all the
conditions are favorable. The most remark-
able of these sample castings is one on which,
in a space less than 7x12 inches, are the ob-
verse and reverse of the Centennial medal,
a medallion representing the first Congress
in session, and the full text of the Declara-
tion of Independence, with fac-similes of
the autograph signatures of the signers. The
text of the Declaration is in raised letters,
somewhat smaller than the type in which
this article is printed, but every word is
clearly legible and nearly every letter clear
and distinct. Every part of the casting will
bear the closest examination—microscopic,
indeed—and its perfection of detail is sur-
prising. Among the others are a variety of
oval and oblong panels, with figures in high



ing worn rails to flat or bar iron, which con-
sists in gradually reducing, in rolls, the
metal forming the head and flange of the
rail without confining the web, and forcing
a portion of the metal into the web and to
either side of the rail, forming a bar thicker
than the web and wider than the rail.

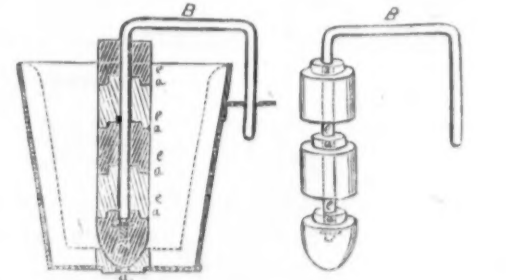
2. A pair of rolls having collars or bear-
ings B C D and grooves e f.

STOPPING-SLEEVE.

To A. J. Hays, Johnstown, Pa.—June 18.

The stopper for steel ladles, consisting of
the rod B and the short perforated bled-

relief. The panel containing the Declaration
of Independence was taken from an electro-
type; the others are very perfect reproduc-
tions of German bronzes. They were made
without especial care, using the same sand,
the same iron and the same labor employed
in making the ordinary stove plates. They
are not, perhaps, as smooth as the remark-
able castings exhibited in the Russian de-
partment of the Centennial, but they are
very extraordinary for castings made under
the same conditions as stove plates, and are
certainly the best American castings we



clay sections C C C', secured on said rod,
and engaging with each other by the end
projections a and end recesses e.

SAD-IRON.

To Isaac P. Chalfant, Philadelphia, Pa.—
June 25.—1. In combination with an iron,

have ever seen. The iron used is a mixture
of No. 1 Lehigh anthracite pig of different
makes, which the Magee Furnace Company
consider the best metal obtainable. They
certainly show the capacity of cast iron for
art reproductions in a very striking way.



USE THE BEST.

NEW



THE NEW AMERICAN FILE COMPANY have the exclusive right to use the Bernot process for cutting Files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing Files and Steel.

NEW AMERICAN FILE CO., Pawtucket, R. I.

AUBURN FILE WORKS,
Superior Hand-Cut
FILES AND RASPS,
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.
FULLER BROS., Sole Agents,
89 Chambers and 71 Reade Streets, N. Y.

Granted for



McCAFFREY & BRO.,
Pennsylvania File Works,
Fourth St., north of Columbia Ave., Philadelphia, Pa., U. S.

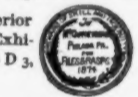
Superior Goods.

Silver Medal.



Domestic and foreign buyers who are desirous of handling a superior File or Rasp should send us their orders. Gentlemen visiting the Exhibition Universelle in Paris are invited to examine our exhibit at D 3, American Section.

Highest Premium.



Steam and Frost prevented on Show Windows.



REVOLVING VENTILATORS

For everything (and every size), from a hat or cap to an exhibition building.

Kitchens, Laundries, &c., ventilated without draft. Durable, strong, without rivets or solder. Oiled for six months. Each one has storm cap. Retail price, size six inch diameter, \$1.00 and upwards; apparatus with which any one can cut circles in glass, 15 cents each.

Protective Ventilators avoid drafts, exclude dust, dampness, malaria and germs of disease; adopted by hospitals, schools, institutions, &c.; applied to any window or room.

Prof. A. L. Loomis, M. D., University of City of New York, writes as follows:

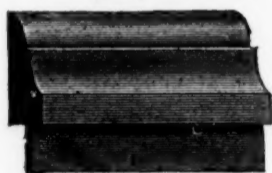
"From my personal experience and that of my patients who have used your Ventilator during the past six months, I am convinced that your method of removing dust, impurities and dampness from the atmosphere is the best which has as yet been proposed. By it the air in an apartment can be constantly changed without causing drafts. I would especially recommend its adoption in sick rooms, sleeping apartments, nurseries and school rooms."

Air Filters and Moisteners, placed over hot-air registers of furnaces, &c., prevent dust and supply steam filtered air. Prices and discounts to the trade sent on application.

The "Economy" Molding Weather Strip is perfect in every respect. By enlarging edge of rubber or felt, and making slot in molding to correspond (see engraving), we save all after expense of molding. Once purchased it will last a lifetime, because rubber, etc., has only to be removed by taking old piece out of either end of molding, and sliding in a new piece. By this method of securing rubber all uncertainty of fastening or undoing of glue or tacks is overcome.

Rubber supplied with enlarged edge and instructions to enable Car Manufacturers, Carpenters, Builders and far off trade to make slots in Sashes, Doors, Mouldings, &c., and thus make perfect Weather Strips.

No. 6.



BRACHER VENTILATOR CO., No. 3 Park Row, New York.

Extension Cylinder Night Latches.

KING'S PATENT, June 26, 1877.

Cylinders adjustable for doors from 1 1/4 inch to 2 inches.

FRANCIS MANY,
143 Chambers St., New York.

"Common Sense"

MOUSE TRAPS,

For Home and Export Trade.

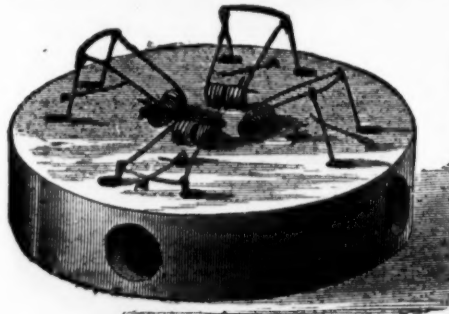
BEST IN MARKET.

RIPLEY MFG. CO.

Unionville, Ct., U. S. A.,

Manufacturers of

House Furnishing Hardware.



FILES & RASPS,

Best Cast Steel.

HAND-CUT. Manufactured by

JOHNSON & BRO.

No. 1 Commercial Street, Newark, N. J.

ESTABLISHED 1850.

Chas. Spruce & Co.,

Manufacturers of HAND CUT

FILES AND RASPS.

Every File warranted.

CHALMERS & MURRAY,

Sole Agents, 76 Reade St., New York.

SPENCER & UNDERHILL,

84 Chambers St., N. Y., Agents for

American Screw Co.'s Wood, Machine and

Rail Screws, Stove and Tire Bolts, Rivets, &c.

O. Ames & Sons, Shovels, Spades and Scoops.

A. Field & Son, Tacks, Brads, Nails, &c.

G. F. Warner & Co., Carriage Clamps.

We have also on hand a general assortment of Hardware



THE GIANT PAD LOCK.

Manufactured by

THE SMITH & EGGE MFG. CO.

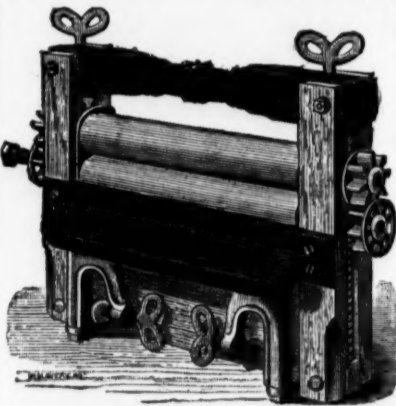
(Centennial Award.)

"Superior in Every Respect."

This is one of the best-selling Locks in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very hard, some in appearance, and every Lock is warranted. Orders solicited. Address as above.

Lock Box 105, Bridgeport, Conn.

Keystone CLOTHES WRINGERS.



Wood Frame Cog-Wheel Wringers.

No.	Size of Rolls.	Price per doz.
10	10X1 1/2	\$60.00
12	10X1 3/4	63.00
14	11X1 1/2	68.00
16	11X1 3/4	71.00

Wood Frame Friction Wringers.

No.	Size of Rolls.	Price per doz.
1 1/2	10X1 1/2	\$51.00
1	10X1 3/4	54.00
3	11X1 1/2	60.00

Self-Adjusting Iron Frame Friction Wringers.

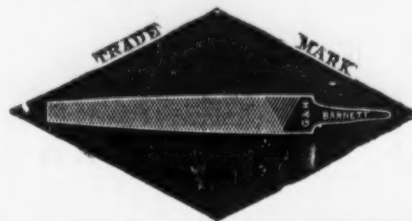
No.	Size of Rolls.	Price per doz.
2 1/2	10X1 1/2	51.00
2	10X1 3/4	54.00
4	11X1 1/2	62.00

EVERY WRINGER WARRANTED.

Special rates given for export. Send for price list of other goods for home and export trade.

F. F. ADAMS & CO.,
Erie, Pa.

Black Diamond File Works.



Awarded by Jurors of Centennial Exposition, 1876, for

"VERY SUPERIOR GOODS."

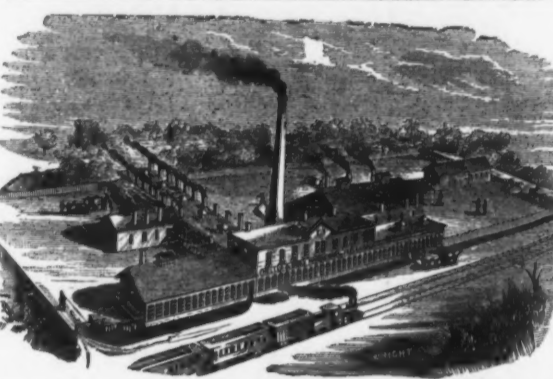
G. & H. BARNETT,

39, 41 & 43 Richmond St., Philadelphia.

CHARLES B. PAUL,

Manufacturer of HAND CUT FILES.

Warranted CAST STEEL. 187 Tenth Street, Williamsburgh, New York. Established 1863.



HELLER & BROS.,
Newark, N. J.,
Manufacturers of Celebrated
American Hand-Cut Horse Rasps
and Files.
For Sale by Iron and Hardware Dealers generally.

ESTABLISHED 1848.



C. T. DRAPER & CO.
Sing Sing, N. Y.
Manufacturers of "SUPERIOR"
HAND CUT

FILES AND RASPS
Made from Best
ENGLISH CAST STEEL.
Quality guaranteed by written warranty
when required.

AUSABLE HORSE NAILS

POLISHED OR BLUED.

HAMMERED AND FINISHED



The Ausable Nails

Are Hammered Hot,

And the Finishing and Pointing are Done Cold,

Thus Imitating the Process of Making Nails by Hand.

Quality is **Fully Guaranteed.**

For Sale by all Leading Iron and Hardware Houses.

ABRAHAM BUSSING, Secretary,

4 Warren Street, New York.

The only **GENUINE D. R. BARTON Tools**

ARE MADE BY

THE D. R. BARTON TOOL CO.,

Cor. Mill and Furnace Streets,

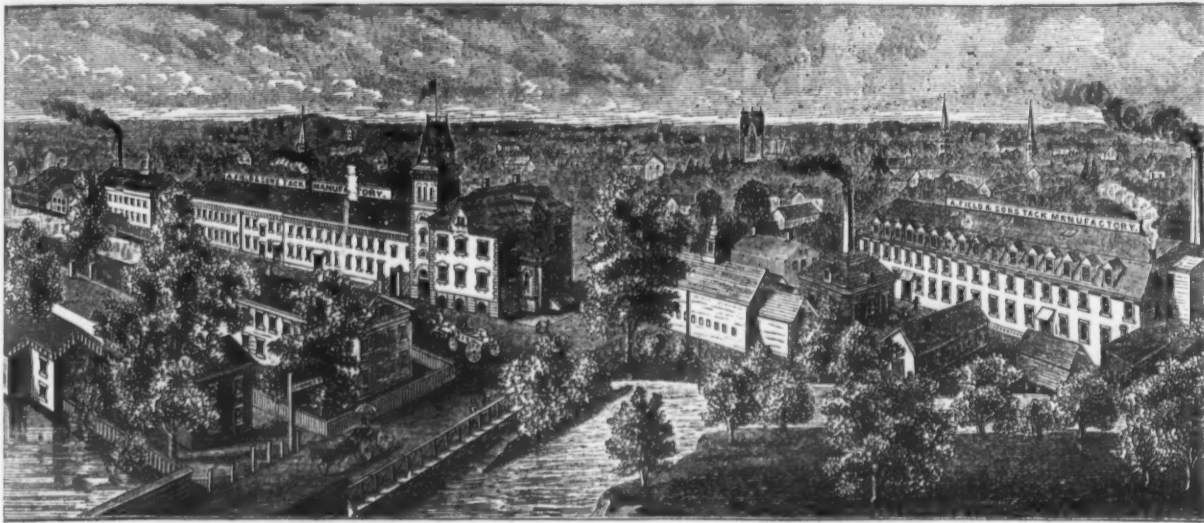
ROCHESTER, N. Y.

AGENCIES:

HEATON & DENCKLA, 507 Commerce Street, Philadelphia, Pa.
H. O. STRATTON, 33 Silver Street, Boston, Mass.
HUNTINGTON, HOPKINS & CO., Sacramento.
NATHAN WOOD, 4 Gold Street, New York.

A. FIELD & SONS,

TAUNTON, MASS.



MANUFACTURERS OF

TACKS OF ALL KINDS.

Shoe Nails, Fine Two Penny and Three Penny Nails, Channel, Cigar Box and Chair Nails, Leathered Carpet Tacks, Glaziers' Points, Etc.

OFFICES AND FACTORIES AT TAUNTON, MASS. WAREHOUSE AT 75 CHAMBERS STREET, N. Y.,

where may be found a full assortment of Tacks, Brads, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above-named goods made from samples to order.

Hoisting Machinery
MANUFACTURED BY
CRANE BROTHERS MFG. CO.,
Chicago.

The Upright Family Scale
PATENTED.



With Tin Dish.
Weighing 12 lbs.
by 1/2 lb.

List \$16 per
Dozen.

Liberal Discount
to the Trade.

This Scale has an
attachment for
Taking the
Tare. Just the
thing for family use.

Manufactured by
JOHN CHATILLON & SONS,
89, 91 and 93 Cliff St., NEW YORK.

Geo. M. Eddy & Co.,
351 & 353 Clinson Ave., Brooklyn, N. Y.
Manufacturers of

MEASURING TAPES.
Of Cotton Linen and Steel.

For all purposes for which Tape Measures are required.
Only manufacturers of

Paine's Patent U. S. Standard Steel
Measuring Tapes,

Pat. Spring Measuring Tapes
of Linen and Steel.

FINE TEMPERED STEEL SPRINGS,
FINE TEMPERED STEEL BAND SAWS,
From 1/4 inch wide upward. Warranted tougher than
any other Band & Saw. Catalogues on application.

PRIZE MEDALLISTS:

London, 1862; Oporto, 1865; Dublin, 1865; Paris,
1867; Moscow, 1873; Vienna, 1873, and only
Award and Medal for Self-Coiling Steel
Shutters at Centennial Exhibition,
Philadelphia, 1876.

CLARK & CO.,

ORIGINAL INVENTORS AND SOLE

PATENTERS OF

Noiseless Self-Coiling Revolving

STEEL SHUTTERS,

FIRE AND BURGLAR PROOF.

Also Improved

Rolling Wood Shutters

Of various kinds. Clark's Shutters are the **Best**
and **Cheapest** in the world. Are fitted to new
Tribune Building, Lenox Library, Delaware and Hud-
son Canal Co.'s Building, Transatlantic Steamship
Co.'s new Dock, American News Office, &c., Posey
County Court House, Mt. Vernon, Holt County
Court, Oregon, Mo. Also to buildings in Boston,
Cincinnati, Detroit, Janesville, Wis., Baltimore,
Canada, &c. Have been for years in daily use in
every principal city throughout Europe, and are in-
dorsed by the **Leading Architects of the**
World. Office and Manufactory,

162 & 164 West 27th Street, N. Y.

ANSONIA CORRUGATED STOVE PLATFORM

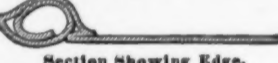
Manufactured by the

Ansonia Brass & Copper Co.

Office, 19 & 21 Cliff Street,
NEW YORK.



Cut Showing Round Platform.



Section Showing Edge.

ANSONIA
Bronzed Fire Screen,

With Ornamented Mouldings.

PATENT APPLIED FOR.

The Portable Bronzed Fire Screen or
Shield, as shown in the illustration, is especially
designed for the safety and protection of walls, fur-
niture, woodwork, paper or varnish from heat.
Being constructed of metal, with firm and substan-
tial edges, curved in form to stand alone, it may be
easily adjusted to any position about a stove, before
a grate or fire place. The demand for something
useful, durable and ornamental as a Fire Screen has
long been felt, and having finally accomplished the
desired result, we are prepared to fill all orders
promptly.



CHAINS UNION CHAIN WORKS,

REITER & MORTON,

Pittsburgh, Pa.,

Manufacture all kinds of

Coil, Cable, Crane, Railroad, Wagon and Agricultural Chains,
From Best Standard Brands of Iron.

Our Chains are all thoroughly tested and warranted, and will be found equal to the
best of either home or foreign make.

Prices the very Lowest.

BROWN & SHARPE MFG. CO

Providence, R. I.,

MANUFACTURERS OF

MACHINERY & TOOLS.

Gears Cut and Index Plates Made and
Drilled to Order.

PATENT CUTTERS FOR THE TEETH
OF
GEAR WHEELS



can be sharpened by grinding without changing their
form. Cutters made on this plan will outlast many of
the old form, with the advantage of being always ready
for use. If the cutter becomes dull before a wheel is completed, it can be taken out, sharpened and
returned to its place in a few moments without risk of altering the form of teeth to be cut. Cutters
for milling any irregular form made to order on the same plan. Parties having occasion to use mills
for irregular shapes on sewing-machine, gun or other work, will readily see the advantage such cutters
possess over those in general use, both as regards economy and convenience. Descriptive circular
with price list sent by mail on application.

RHODE ISLAND HORSE SHOE CO.,

OFFICE, 81 Canal Street, Providence, R. I. WORKS at Valley Falls, R. I.

Manufacturers of

PERKINS and RHODE ISLAND PATTERNS OF

HORSE AND MULE SHOES.

Copper, Bronze and Iron.

Although we wish to speak chiefly con-
cerning the execution of small objects in
metal, it may not be improper to remark
that the general employment of iron in
modern days for the purposes of construction
in buildings is owing to its strength,
elasticity, toughness and durability, qualities
which obviate many difficulties otherwise
insuperable. On the other hand, great care
is required in order to avoid the violation of
the laws of good taste and proportion. Ar-
chitects cannot but use iron largely in many
buildings, but no ornament peculiarly iden-
tified with stone or marble should be intro-
duced, nor any construction in iron which
could be better executed in another material.
A needless display of strength is as objec-
tionable as weakness, and ironwork should
never be obtrusive.

The sacred writings contain many refer-
ences to the very early employment of
various metals for domestic use and personal
ornaments. We read in the Pentateuch of
the riches of Abraham; of the jewelry
offered to Rebecca; of the cup given by
Joseph to his brother; of molten and graven
images; of iron tools, beaten work, brazen
vessels and the like. The ancient Egyptians
were skilled workers in metal, and so also
were the Assyrians.

Classical writers, Greek and Latin, are
full of references to and descriptions of
numerous works in metal. Armor and
weapons, it need scarcely be said, were
among the most frequent objects, and natu-
rally would advance in merit and beauty of
workmanship from the plain spear-head,
hatchet, or shield of primitive ages to the
period of the best Greek art. The Egypt-
ians and the Greeks had some means of
hardening and tempering their instruments
of bronze with which we are unacquainted.
No example as a work of art is to be found
in any collection more exquisite than two
portions of the fittings of a breastplate or a
cuirass in the British Museum. These
fragments represent two groups in very high
relief, the subject of each being a combat
between a Greek warrior and an Amazon.
In both groups the Amazon has fallen on one
knee; the antagonist kneels against her
side, grasping her hair with one hand. The
relief is so prominent that some of the most
salient parts, the hands, the knees, and some
part of the draperies appear almost to be
detached from the ground. In the heads
the plate is reduced to the thickness of a
sheet of writing-paper, and on the reverse
are cavities nearly an inch deep. These
fragments have been long and deservedly
celebrated as the finest existing examples of
such work. They were found in 1820, in
Lucania, in southern Italy. In 1833 they
were purchased for £1000 for the British
Museum by a subscription, to which the
trustees contributed £200. The size of each
fragment is about 6 by 7 inches.

Bronze is an alloy much harder than
copper, and was employed before the
method of working iron was understood,
and has the important property of attaining
various degrees of hardness, according to
the rate of cooling from the fused state.
When rapidly cooled it is soft; when slowly,
hard. Thus tools of bronze could be made
capable of fashioning the same metal in a
softer condition. The Phoenicians in very
early times, perhaps a thousand years before
the Christian era, traded largely with En-
gland, and taking home the mineral ores
from Cornwall and Devon, probably supplied
the Eastern nations with the necessary ma-
terials. A systematic analysis of the bronze
weapons and works of art of all periods
which are still extant, found in different
localities, would doubtless throw great light
upon this important branch of ancient and
medieval industry.

The term bronze has been generally
adopted by archaeologists to designate a
mixed metal composed chiefly of copper
with an alloy of tin, which latter is gen-
erally found to range from 8 to 10 per
cent. Copper ores are more or less abun-
dantly distributed in almost every country
of the world. Cyprus seems to have been
one of the earliest sources of this metal used
by the ancients; but the mines of Spain,
Anglesea and Cornwall were also known to
them. We have abundant proof that the
Romans worked copper mines in England
and Wales, their tools and stamped cakes of
the metal having been found. Picks, bronze
celts and wooden shovels of Roman and
earlier times have been discovered in the
stream tin workings of Cornwall. By the
melting together of these two ores, copper
and tin, bronze is produced differing in color
from either of the constituent elements, as
also in other qualities. In place of metals,
the one white the other ruby color, we
obtain a closer substance of a golden brown.

In Britain and in Ireland celts, or axes,
swords and other weapons were made in
great quantities in extremely remote and
even prehistoric times. Many of the exam-
ples which have been discovered in excava-
tions and in old burial places are of good
workmanship and design. The collections
of the British Museum and of the Royal
Academy possess some admirable specimens.
A few of the molds from which the objects
were cast have also been found. Before the
art of casting was discovered statues were
formed of hammered plates, fastened to-
gether by rivets. An intermediate improve-
ment was introduced, it is said, at Chios, by
which the pieces were soldered instead of
being riveted. The earliest cast pieces were
solid.

It may be well here to give, as briefly as
possible, a description of the usual process
adopted for casting in bronze. When light-
ness is requisite and economy in the use of
metal, statues and other objects are not
made solid, but are cast over a central core.
This is first built up to a rude outline of a
material composed generally of modeling
clay mixed with pounded brick and plaster
of paris. When fashioned it is carefully
dried and the last moisture driven out by
baking in an oven. Upon this core, which
in the case of a large statue is further
supported by iron bars, modeling wax is
overlaid of the required thickness. Upon
this wax the sculptor works, and the
statue leaves his hands in wax, to be re-
placed by bronze. Outside this the mold is
formed, and the greatest care is necessary
that every minute detail shall be filled in

with the composition and without the slight-
est disturbance or abrasion of the finished
waxen surface. The mold is usually a mix-
ture of dried clay and pounded crucibles
with some plaster-of-paris and ground down
with water to the consistence of cream.
Layer upon layer, thickening as each grad-
ually dries, is cautiously placed upon the
mold, so that no air is left in bubbles;
afterward upon the outside is formed a
stouter coating of coarser quality to sustain
the inner mold and to bear the weight of
metal. Thus prepared, after slow drying,
the whole is firmly fixed within an oven,
and the mass is heated until the wax within
has flowed out in a liquid state from every
corner. The core and mold are kept in
their proper position by means of small rods
of bronze, which had been previously in-
serted in the core, passing through the wax,
and with the other ends embedded in the
mold. The liquid metal is then tapped from
the furnace and poured steadily into the
mold, filling every line and detail which the
wax had occupied. After cooling, the mold
is carefully broken away, the core raked
out and all superfluous metal, the connecting
rods, and other rough parts removed. Then
the statue is complete; not as the artist left
it in wax, but in enduring bronze.

The use of bronze in sculpture is of very
high antiquity. An Egyptian figure in that
material is mentioned by Sir Gardner Wil-
kinson with an inscription containing a date
more than 2000 years before Christ.

American Goods in Scotland.—The
following comes from an intelligent Scotch
correspondent: American enterprise is
showing itself in this country in a variety
of ways. Every grocer's shop shows a stock
of canned goods equal to any "cash grocery"
in New York or New Jersey. Peaches, ap-
ples, pears, deviled meats, corned beef,
sausage meat, chicken, tongue, and, indeed,
everything put up in cans with you, can be
had here at almost the price charged in your
good retail stores in New York or Brooklyn.
The importation of American cattle—alive
and dead—is increasing, live beasts being,
however, the great feature. Several droves
were bought in Glasgow lately, sent by rail
to Aberdeen, killed and dressed for the Lon-
don market, shipped thither, and sold as
Aberdeenshire fat cattle, and, I am told,
yielded a very fair margin to every hand
they passed through. We buy good rolled
bacon here in lumps at 4 pence per pound.
It pays a retail profit, a wholesale commission
in Glasgow, freight, and shipping profit in
New York. Query, after allowing for curing,
packing, and railroad tolls, how much is left
for the pig-raiser? American furniture is
coming to the front too. Our grand new
hotel has all its bed-rooms furnished direct
from American factories. Garden and field
implements are cutting out the Sheffield pro-
ducts; even stoves are beginning to dawn
upon the native mind; but for all that the
"British workman" stands like the dog in
the manger, barking at the capitalist who
wishes to introduce improvements in ma-
chinery or lengthen the day from 9 to 10
hours. He keeps up combinations for his
"rights"—commonly called trade pro-
tection societies—strikes on the slightest
departure from what their rules and regulations
demand, shuts his eyes to the advances made
by our countrymen over the way, and forgets
that they are almost next door, working the
same machinery 11 hours that he refuses to
run more than 9. He trusts to his union,
while with you the workman trusts to his
superior skill and activity for his reward.
Our unions have ended individual ambition,
and the best workmen are content to herd
along with the drones because they are all
paid alike.

Manufacturing in French Prisons.—
There are twenty-one central prisons in
France for prisoners with sentences of five
years and over. The cellular system is
adopted in prisons for the detention of pri-
soners not sent up for more than a year and
a day, but in the central prisons as many as
100 men sleep in one ward, certain of their
number being responsible for the preserva-
tion of order. The dormitories are lighted,
and there are openings from the galleries
through which the guards may inspect them.
By day the men work in *ateliers*, fifty or a
hundred in each. Shoes, chairs, woven
fabrics, buttons, umbrella-ferrules, Chinese
lanterns, &c., are manufactured, and such
light work as glossing paper, sewing copy-
books and making hair ornaments is done.
The work is let to contractors by tariff fixed
by the local Chamber of Commerce, to pre-
vent any undue competition with free labor.
Half of the profits of the prisoner's work
goes to the State; he is allowed to spend a
quarter in procuring special articles of diet,
&c., and the remaining quarter is paid to
him on leaving, so that a discharged convict
often finds himself with from \$100 to \$300
cash capital. A large proportion of the
prisoners use this in setting themselves up
in trade or in procuring passages to other
lands. These rewards of industrial labor,
together with the industrial training itself,
constitute together the main and tolerably
effective counterbalance to the otherwise
grave evils of association. The element of
hope is always prominent in French prisons
and it is the sheet-anchor of their adminis-
tration. A visitor to La Sante, at Paris,
observed in the first cell he inspected a table
on which lay a pipe of tobacco, a half bottle
of wine and a novel.

It is asserted on apparently good authority
that the Superior Commission of the Inter-
national Exposition has resolved to prolong
the Exposition to the 20th of November, in
order to give opportunity for the sale of the
exhibits, and that the drawing of the lot-
tery, the prizes in which include many of
the articles on exhibition, will also be post-
poned to the 20th of November. Most of
the foreign exhibitors are at present dis-
posed to begin packing up on the day origi-
nally designated for the closing of the Ex-
position—the 1st of November. The influx
of visitors is again very large, all the hotels
and lodging houses being full.

The eruption of Mount Vesuvius is in-
creasing. The base of the new cone is now
covered with lava, which is streaming down
the sides of the mountain.

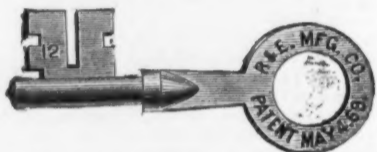
RUSSELL & ERWIN MANUFACTURING COMPANY

Manufacturers of HARDWARE.

FACTORIES, - - - NEW BRITAIN, CONNECTICUT, U. S. A.

MANUFACTURERS' AGENTS AND DEALERS IN GENERAL HARDWARE AT OUR

WAREHOUSES: NEW YORK, 45 & 47 Chambers Street; PHILADELPHIA, 425 Market Street; BALTIMORE, MD., WM. H. COLE, Agent, 17 South Charles Street.



Steel Key Pad Lock, No. 1219.



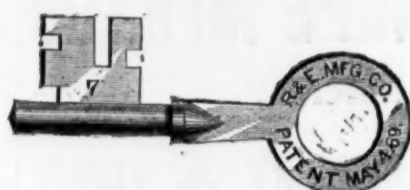
Flat Steel Key Pad Lock, No. 421.



Steel Key Pad Lock, No. 1213.



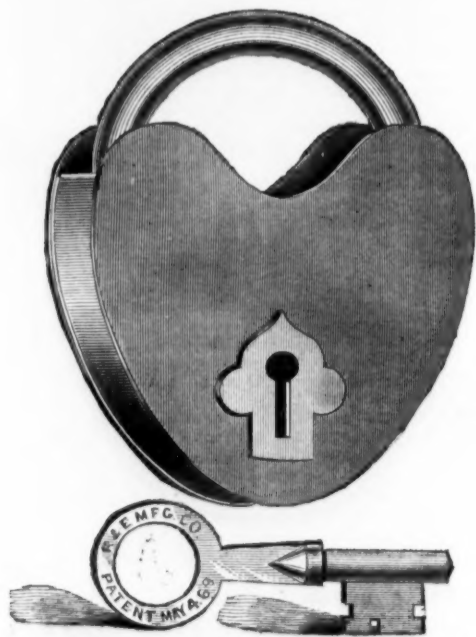
Steel Key Pad Lock, No. 1220.



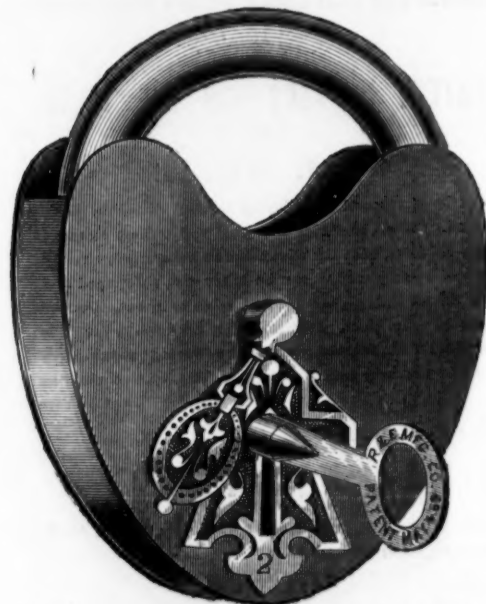
Steel Key Pad Lock, No. 1212.



Polished Malleable Iron Key Pad Lock, No. 230.



Steel Key Pad Lock, No. 1200.



Steel Key Pad Lock, No. 1206.



Steel Key Pad Lock, No. 1203.

Cutlery.

FRIEDMANN & LAUTERJUNG,

Manufacturers of PEN AND POCKET CUTLERY.

Solid Steel Scissors, Shears, Razors,
Russia Leather Strops, Hones, &c.

"ELECTRIC RAZORS,"

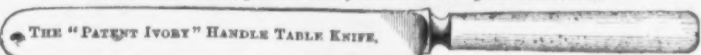
And the celebrated "ELECTRIC SHEARS." Nickel Plated
Hones.

Agents for the BENGALL RAZORS.

AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &c.
1 Chambers and 73 Reade Sts., N. Y. 423 N. Fifth St., ST. LOUIS, MO.

MERIDEN CUTLERY CO.

The Oldest Manufacturers of Table Cutlery in America.



EXCLUSIVE MAKERS OF THE

CELLULOID

HANDLE FOR TABLE CUTLERY. A most beautiful and perfect substitute for Ivory. Also makers
of all kinds of TABLE, BUTCHER AND HUNTING KNIVES.
Illustrated catalogues with prices sent to the trade on application. 49 Chambers St., New York.



ESTABLISHED 1853.



HALL, ELTON & CO.,

Electro Plated Ware, German Silver and Britannia Spoons.



Factories, Wallingford, Conn.

Salesroom, 75 Chambers Street, New York.

THE FRARY CUTLERY COMPANY,

FACTORY, BRIDGEPORT, CONN.

NEW YORK OFFICE & WAREHOUSE, with WIEBUSCH & HILGER HARDWARE CO., 84 Chambers St.

Manufacturers of all kinds of Table Cutlery.



The above illustrations represent their New Patent Screw Tang Lock Fast Solid Handle Knife.

There is no question but that a solid handle knife is much more preferable than a scale tang. The great objection to their use hitherto is, that no solid wood handle has been placed on the market with the handle properly secured—no handle put on with cement will stand the wear and tear of every day usage. The cement will expand and contract with the action of heat and cold, and become loose, crack and come off, causing great prejudice against their use. This objection is overcome in our patent screw tang. A wood screw is welded to the tang of the knife or fork, and screwed firmly and securely in the handle and locked there by the bolster, making a very strong and handsome knife, which we warrant never to get loose, crack or come off. We manufacture a large variety of patterns, both Table, Butcher and Carvers, and furnish the latest handle nearly as low as the scale tang. We are prepared to furnish this line of goods, together with the scale tang and iron handle, very promptly, and very respectfully invite the attention of the trade.

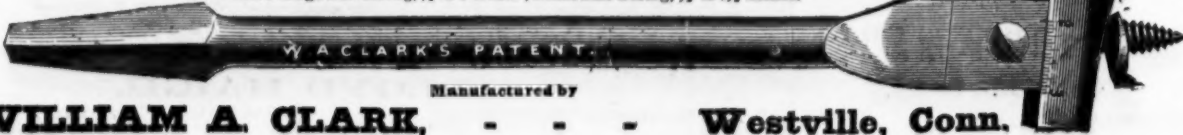
HOLROYD & CO.,

Waterford, N. Y.



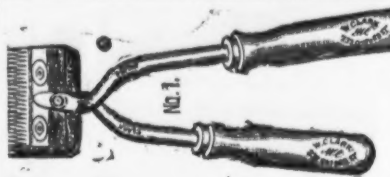
CLARK'S PATENT EXPANSIVE BITS

Made of JESSOP'S BEST CAST STEEL, and warranted superior to any other
Two sizes: Large Size Boring, 1/4 to 3 inches; Small Size Boring, 1/8 to 1 1/4 inches.



WILLIAM A. CLARK, Westville, Conn.

Cutlery.



McCoy & Co.,

134 & 136 Duane Street, New York.

SOLE WHOLESALE AGENTS

CLARK'S

PATENT HORSE CLIPPER

Five styles. Fully described by our circular and price list, which we will send on application. The genuine are stamped on both the wooden and metal parts, as shown in the illustration, as a protection against inferior imitations. All repairs executed with care and dispatch.

HERMANN BOKER & CO.,

101 & 103 Duane Street, New York,

SOLE AGENTS FOR THE



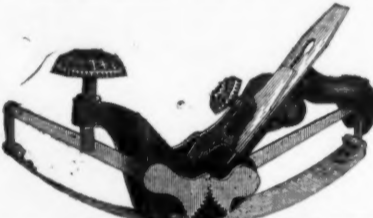
All of Gardner's Patent Knives are fully warranted.



STANLEY RULE AND LEVEL CO.,

MANUFACTURERS OF

Improved
Carpenters'
Tools.



FACTORIES,

New Britain, Conn.

WAREHOUSES,

29 Chambers St.,
New York.

Cutlery.

JOSEPH S. FISHER,

No. 411 Commerce St., PHILADELPHIA

George Wostenholm & Son,
"Limited."

Washington Works, SHEFFIELD,
Celebrated I-XL Cutlery, Razors, &c

AGENT FOR

WALTER SPENCER & CO.,
Steel and File Manufacturers,
Rotherham, ENGLAND.

CORPORATE MARK



Granted 1777.

The Future of Mexico and Trade Relations with the United States.

With his usual courtesy Signor Zamacona, Mexican Minister to the government at Washington, favored the representative of *The Iron Age* with full information concerning his recent tour in the West and the objects he is zealously endeavoring to bring about. His visit to Chicago, Pittsburgh and other Western cities had, he said, been highly satisfactory. He foresees in the future of his own country a development like that of the West. There is a similarity of resources, mining and agricultural. They have in Mexico the same fertile lands that he had seen in Illinois and Minnesota, capable of producing crops in equal abundance. The climate is rather milder. The urgent needs of the country at present are improved appliances in the various industries and adequate facilities for transportation. Railways can be built there to advantage, even where the population is very sparse. He noticed that railroads about Chicago were built in a wilderness, but produced a wonderful development. The trunk line from Vera Cruz to the capital has several important branches, of which one to Toluca, about 75 miles in length, is near completion, and there is a new line in progress across the State of Guanajuato, the system as a whole facilitating the distribution of merchandise in one direction, and the movement of agricultural products and minerals both from the North and South, especially in the State of Hidalgo.

There are two elements essential to the success of every industry, iron and coal, both of which Mexico has in exhaustible quantities. Deposits have lately been discovered in the States of Puebla and Vera Cruz—the former may be considered the "Pennsylvania" of Mexico—also on the seaboard, but owing to the difficulty of transportation they are not worked. The coal mines in Vera Cruz are extremely rich, samples of bituminous sent to New York having sold for \$2 more per chaldron than the English cannel.

"We need help from the United States," said the minister with emphasis. The Mexicans must be supplied with all kinds of machinery employed in agriculture and mining, and must be assisted in learning their use. They have in the country several foundries and rolling mills, but they are small and of primitive construction.

Signor Zamacona predicts that a large and active trade between the United States and Mexico is sure to come. When asked concerning the prospects of continued tranquillity in Mexico, Signor Zamacona said he had confidence in the disposition of the people, which is averse to political agitation and fully determined in support of the peaceful policy proclaimed under the administration of President Diaz. This sentiment was brought about by the drift of public opinion, which will not tolerate dissent, and which was manifested in its disapproval of Lerdo's proposed second term in the executive chair. Diaz seeks to incorporate in the constitution of the republic provisions against a second term.

With regard to ocean steam lines, the only lines existing are those to New York and to New Orleans, both subsidized. The rates from New York are too high, and the consequent embarrassment to trade appears in the fact that Sig. Zamacona has been waiting two months to ship goods by a sailing vessel without any opportunity offering.

To introduce agricultural machinery into Mexico it is of the first importance that the governors of the several states cooperate, and Sig. Zamacona has advised them to keep full lines of goods, and to maintain experimental farms to exhibit practically the results of improvements introduced into modern agriculture. If rates of freight can be lowered he is assured that there will be a large importation into Mexico of American machinery and implements. Labor in Mexico is abundant at from 25 to 30 cents per day, and the products afford generous returns.

The Mexican minister, in a word, believes that as Mexico is geographically our nearest neighbor and politically in accord with us, the two peoples are destined to become commercially one nation. While in New York he will endeavor to see, as far as practicable, manufacturers and others who are interested.

Iron Manufacture in India.—About eighteen years ago two attempts were made to introduce in India the manufacture of iron on the European system, the first being the Kumaon Iron Works, and the second similar works started by Col. Keatinge at Barwai, on the Nerbudda. In both of these cases it was expected that the abundant ore might be reduced to iron by the use of charcoal from the large forests surrounding the works, but it turned out, unfortunately, that the cost of production was too high for profitable working. The latest effort of English enterprise in this direction is the establishment of the Bengal Iron Works Company. Formed in the year 1874, when iron in England commanded prices unprecedentedly high, and nearly three times those now prevailing, this company selected for its operations a much more favorable situation. Purchasing a property on the Burrakur branch of the East Indian Railway, central to the best collieries of the Bengal coal-field, and surrounded by abundant and easily accessible supplies of good ironstone, the Bengal Iron Works Company there established its works, and faced boldly the troubles and difficulties inseparable from the establishment of a new industry in India. They have been overcome, and the product of cast iron from the furnace now working has, during the past nine months, been highly satisfactory. The iron is of very good quality.

The Wood Tariff Bill in France.—The foreign correspondent of *Iron* notes the following amusing version of the Wood bill by a French contemporary: We may remark that the bill known to debaters in the White House at Washington as the Wood bill, is, perhaps, not quite accurately described by *La Houille* as a "bill sur le bois" (bill on wood). A whole tower of argument is piled upon the foundation of the Wood bill being a "bill sur le bois," and it is quite a pity to see such a waste of ratiocination.

CORPORATE MARK,



Joseph Rodgers & Sons' (LIMITED)

CELEBRATED CUTLERY,
No. 82 Chambers Street, New York.
F. & W. CLATWORTHY, Agents.

The demand for Joseph Rodgers & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam power. To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear our Corporate Mark.

ESTABLISHED 1832.

NEW YORK KNIFE CO.

MANUFACTURERS OF SUPERIOR

Table & Pocket Cutlery,

WARRANTED TO BE MADE OF THE BEST MATERIAL.

WALKILL RIVER WORKS,

Walden, Orange Co., New York.
THOS. J. BRADLEY, President.

ALFRED H. HILDICK,

12 Warren St., N. Y.
Importer of CHAINS, ANVILS, VISES, &c.

Agency of
HILL BROTHERS & CO., WALSALL, ENGLAND,
GENERAL HARDWARE MERCHANTS,
And of

BALL'S PAT. SOLID STEEL SHEEP SHEARS.

These shears are unsurpassed for cheapness, durability and utility. They are made of one solid piece of steel from point to point, and cannot be broken in use either in the bow or at the junction of the shank and blade. Samples can be seen at above address, or sample lists furnished.

KRAUSS & HAHN,

Importers, Manufacturers and Dealers
In all kinds of

Cutlery and French Grindstones,

152 Centre, cor. Walker St., N. Y.

Ground slides Razors of all brands imported and concealed by steam power for the trade. Price for concealing from \$3 to \$5 per dozen. Price list sent on application.

Wilson Bohannon,

Manufacturer of Patent

BRASS Pad Locks,

FOR
Railroad Switches, Freight Cars,
and the Hardware Trade.

All sizes, with Brass and Steel
Keys, with & without chains.

Passenger Car Locks,
Bronzed, Nickel-Plated and
Japanned.

Patent Tubular Night Latches.
Will answer for Doors from 1 1/4 to 2 inches.

BROOKLYN, N. Y.
Catalogues and Samples sent upon application.

S. H. & E. Y. MOORE,
68 Lake Street, CHICAGO, ILL.,
Heavy Hardware & Railway Supplies.
AGENTS FOR
Providence Tool Co., Reading Bolt & Nut Works, Syracuse Bolt Co.,
And Other Manufacturers.



CLIMAX BARN DOOR HANGERS,
MOORE'S

Anti-Friction Sliding Door Sheaves,
" " Parlor Door Hangers,
" " Baggage Car Door Hangers,
&c., &c.

We invite the attention of the trade and of architects to the accompanying cut of Moore's ANTI-FRICTION PARLOR DOOR HANGER. It is by far the

Simplest, Strongest, Most Durable, Easiest Working and Most Readily Adjusted

Hanger ever made for Parlor Doors. It runs on $\frac{1}{4} \times 1\frac{1}{4}$ flat iron track, and is absolutely noiseless in operation.

Depot for goods of our manufacture:

FERNALD & SISE, 100 Chambers Street, New York.
E. & C. GURNEY & CO., Hamilton, Canada.

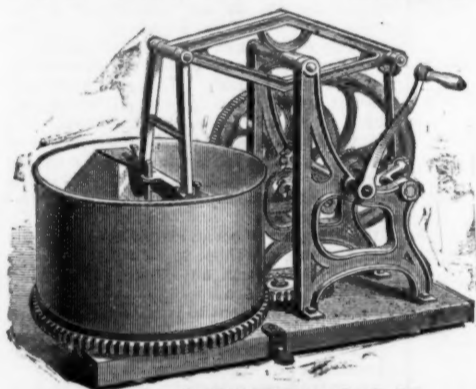
MIRROR STOVE POLISH.

It will COVER MORE SURFACE than any other in the market, and is the ONLY BLACKING that can be applied to a HOT STOVE, or that will receive a POLISH AFTER IT BECOMES DRY. Send for sample.

Manufactured by
S. H. & E. Y. MOORE.



ATHOL MACHINE COMPANY,



AMERICAN MEAT & VEGETABLE CHOPPER,
ATHOL, MASSACHUSETTS.

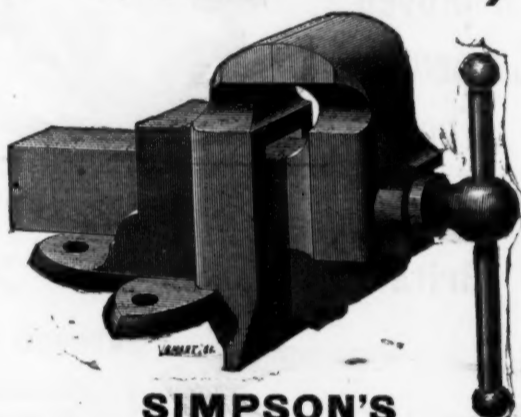
D. W. HOUGHTON, President.

J. S. PARMENTER, Treasurer.

D. A. NEWTON, General Manager.

Referring to above card, we take pleasure in advising our former patrons, and the trade in general, that we have made arrangements to sell and ship, in future, direct from factory, all goods of our manufacture. With location and shipping facilities unsurpassed, we can, at all times, guarantee to all points as low rates on freights as from either New York or Boston.

THE BAILEY WRINGING MACHINE CO., 99 Chambers Street, New York, who have handled our goods for the last three years, will continue to act as General Agents. Special quotations for export. Send for price list.



SIMPSON'S PATENT ADJUSTABLE VISE,
ATHOL, MASSACHUSETTS.

TENNIS & WILSON,

Successors to J. CLARK WILSON & CO.

81 Beekman St., New York.

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Brilliant Corn Popper.

The Best Made Popper in the market.



Square, Full Braced, Wire Lid, Brilliant Wire.



Round, Full Braced, Tin Lid, Brilliant Wire.

LITTLE GIANT NUT CRACKER.

The Only Perfect

Nut Cracker.



Circulars sent on application.
Special Prices made to the trade.

HAYDEN & SMITH,

Auburn, N. Y.,

Manufacturers of

Carriage and Saddlery Hardware,

Owners of

LAMP'S PATENT

Seat Fasteners.



The Safest and only reliable Seat Fastener for Wagons,



THE PRATT & WHITNEY CO.,
Hartford, Conn., U. S. A.,

Make specialties of

DROP HAMMERS,

Punching Presses, Hand Drilling Machines, Ratchet Drills, Combination Lathe Chucks, Cutters for Teeth of Gear Wheels, Screw Plates, Hand Machine, Nut and Pipe Taps, Bolt Cutters, &c., &c.

R. COOK & SONS,

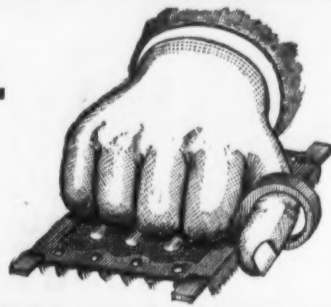
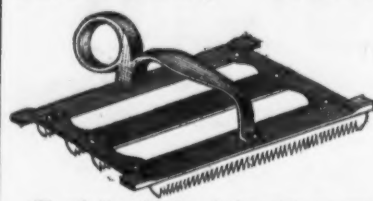
Manufacturers of

Carriage & Wagon AXLES,

WINSTED, CONN.

ESTABLISHED 1839.

HOTCHKISS' Novelty Combs.



We ask the attention of the public to our Patent Novelty Curry Combs, represented above, which are universally acknowledged to be far superior to anything in the market, being neat and durable and the most convenient to handle of any comb yet produced. They are put up in paper boxes of one dozen each, and packed 24 dozen in a case. GIVE THEM A TRIAL. For Sale by the Jobbing Hardware, Saddlery and Woodenware trade.

HOTCHKISS' SONS, Bridgeport, Conn.

Philadelphia "STAR" Bolt Works.

NORWAY IRON

FANCY HEAD BOLTS,

Carriage & Tire Bolts. **Star Axle Clips, &c.**

TOWNSEND, WILSON & HUBBARD, 2301 Cherry St., Philadelphia, Pa.

BLACK AND TINNED IRON RIVETS.



W. P. TOWNSEND & CO.,
PITTSBURGH, PA.,

Manufacturers of every description of First Quality,

RIVETS.



TURNED MACHINE SCREWS,
One-sixteenth to five-eighths diameter.
Heads and points to sample.

IRON, STEEL and BRASS.

Lyon & Fellows Mfg. Co.,

Cor. 1st and North 3d Streets, Williamsburgh, N. Y.

LEWIS, OLIVER & PHILLIPS,

Nos. 91, 92 and 93 Water St., and 114, 116 and

118 First Avenue,

PITTSBURGH, PA.,

MANUFACTURERS OF

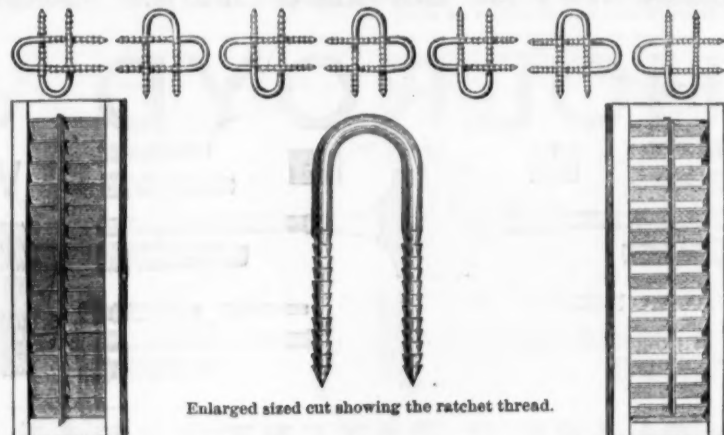
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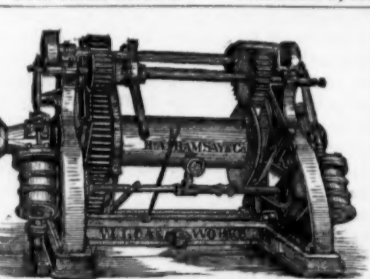
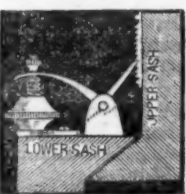
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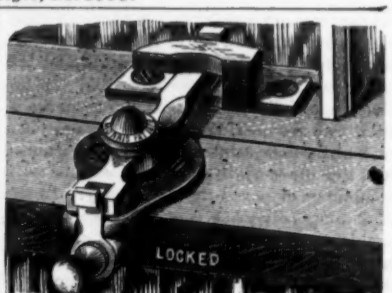


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AND
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CONTENTS.

First Page.—Dubs & Francois' System of Driving Headings in Flery Mines. Hancock Iron Works. British Foreign Trade.

Third Page.—Condition of European Labor and Commerce.

Fifth Page.—Condition of European Labor and Commerce. (Continued). Reclamation of Flooded and Sterile Lands. Signal Service on the Lakes.

Seventh Page.—New Patents.

Ninth Page.—Copper, Bronze and Iron. American Goods in Scotland. Manufacturing in French Prisons.

Eleventh Page.—The Future of Mexico and Trade Relations with the United States. Iron Manufactures in India. The Wood Tariff Bill in France.

Fourteenth Page.—Our Trade with Hayti and San Domingo. Protection for Canadian Industries. Pig Iron in the West. The New Direct Process at the Brady's Bend Furnace.

Fifteenth Page.—Assignment, Exemption and Collection Laws of the Various States. Scientific and Technical Notes.

Eighteenth Page.—The Paris Exposition, Metallurgical Notes.

Nineteenth Page.—Metallurgical Notes. (Continued). Mining Items.

Twentieth Page.—Speculative Building. Relief for the South. A French Industrial Association.

Twenty-first Page.—Trade Report. General Hardware. Iron. Metals. Coal. Exports. Imports. Old Metals. Paper Stock, etc. Philadelphia.

Twenty-second Page.—Philadelphia. (Continued). Pittsburgh. Chattanooga. Boston. Louisville. St. Louis. Cincinnati. Baltimore. Richmond. Foreign.

Twenty-third Page.—Foreign. (Continued). Our English Letter. Labor Notes. Brazilian Credits. French Protection against American Parallel Vices.

Twenty-fourth Page.—Industrial Items.

Twenty-seventh Page.—The Iron Age Directory.

Thirtieth Page.—New York Wholesale Prices.

Thirty-first Page.—New York Wholesale Prices. (Continued).

Thirty-fifth Page.—Philadelphia, Buffalo, Chicago and Pittsburgh Hardware and Metal Prices.

Thirty-seventh Page.—Boston and St. Louis Hardware and Metal Prices.

The largest miners' meeting ever held in Western Pennsylvania assembled at West Elizabeth on Wednesday of last week. Over 2500 miners were present. They agreed to adhere to their demand for 2½ cents per bushel for mining. As we have already

stated, the operators say there is so little demand for coal by reason of the yellow fever South that they are not particular about running their banks. Over 6,000,000 bushels of coal were taken to Ohio River ports on the recent rise, and this can be made available for the lower Mississippi if needed.

Our Trade with Hayti and San Domingo.

Since 1801, when France lost control of San Domingo—after Cuba, the largest of the West India Islands—that country has steadily declined in wealth, productiveness and commercial importance. The French had reared in San Domingo the finest colony they ever possessed, and the year in which the revolution broke out in France, 1789, there were in this magnificent island no less than 10,000 fine estates producing for export 1,500,000 cwts. of sugar, 77,000,000 pounds of coffee, 60,000 cwts. of cotton and 10,000 cwts. of Indigo, representing a valuation of \$30,000,000, and employing 400 vessels. In 1826 the 77,000,000 pounds of coffee had dwindled to 32,000,000 pounds, in 1837 to 31,000,000, and in 1876 to 24,000,000 pounds. With the first troubles sugar planting ceased, and in the portion of the island controlled by the negroes it has not since been resumed. Indigo and cotton have also ceased to be important products of the island. The coffee now produced is notoriously inferior and dirty, and sells for the lowest price of any of the mild coffees. But its culture is the easiest of agricultural pursuits, and this, with logwood cutting, is the principal dependence of the natives.

Those of our merchants who have had the courage and the means to trade with the Haytians in spite of their continual revolutions, have in the long run done remarkably well. As long as the people enjoy the double blessing of peace and an abundant coffee crop, and as long as coffee is tolerably high, everything in the trade goes on smoothly, and enormous profits are realized in some years to make up for losses in others resulting from revolution, extortion, confiscation and failures. In this country we seldom hear of failures among houses engaged in the Haytian trade, but in Europe they are very common, as at the greater distance it is impossible to meet unexpected contingencies by as prompt and decisive action as can be taken by New York and Boston merchants. Hayti and San Domingo are not a field which offers many inducements to the manufacturer seeking to extend the sale of his goods abroad by personal effort. He will do much better, in this instance at least, to seek trade through the established houses in this city and Boston.

Notwithstanding its present condition, its limited production and the indolence and indifference of its people, the country is one which possesses vast possibilities of future development. Hayti, the western portion, has an area of 9232 square miles, and San Domingo 29,595; together, 29,227 miles, the whole island measuring 400 miles in length and, on an average, 100 miles in breadth. Hayti was at first much neglected, since it produced but little of the precious metals, and in 1717 its census showed a population of but 18,410; it now counts 550,000, while San Domingo, although double the size, has but 250,000 inhabitants. Hayti has been divided into five provinces—the Western, Southern, Northern, North Western and that of Artibonite. San Domingo counts seven subdivisions—the provinces of San Domingo, Santiago, La Vega, Azua and Seibo, and the maritime districts of Puerto Plata and Samana. The largest city in Hayti is Port au Prince, with 20,000 inhabitants, and the largest in the Spanish portion, San Domingo, with 16,000 inhabitants. The island is mountainous throughout, but the Spanish portion possesses a magnificent plateau of great extent and fertility, famous for its tobacco crop. Railways have not yet been attempted in the island.

The import into Hayti in 1876 amounted to \$10,549,777, while there were exported \$11,003,086 worth of goods, principal among which were coffee, 23,767,717 pounds, costing \$2,852,160; logwood, 14,687,800 pounds, costing \$58,751; mahogany, \$19,920; cotton, \$17,700; lignum vite, \$15,920, and cocoa, \$6877. There entered in the same year 305 vessels with a tonnage of 284,112, of which 185 were steamers measuring 260,002 tons. The departures were 296 vessels of 273,317 tons, 177 of which were steamers of 249,238 tons. No less than seven European and Anglo-American lines of steamers touch at the principal Haytian ports. The import into San Domingo in 1875 was \$1,745,654, while there were exported \$1,546,809 worth of goods, principal among which were tobacco, 11,613,230 pounds, nearly all shipped to Hamburg and Bremen; 7,152,015 pounds sugar; 264,179 pounds coffee; 115,680 pounds honey; 289,062 pounds wax and 1,375,790 feet of mahogany. There entered in the same year into the port of San Domingo City 162 vessels (of which 42 were English), with a tonnage of 45,297. The departures from that port were 110 vessels of 22,967 tons. The entries into the port of Porto Plata in the same year were 85 vessels (20 of which were steamers) with a tonnage of 25,699. The departures were 25,000 tons.

Our own trade with the island since the war has been as follows, the figures representing thousands of dollars:

	Im- port.	Dom. expt.	For. expt.	Total trade.
1864.....	2,033	4,273	312	6,618
1865.....	1,593	6,248	406	8,247
1866.....	1,340	3,597	230	5,067

1867.....	1,022	2,405	348	3,775
1868.....	843	3,021	309	4,169
1869.....	770	1,349	189	2,208
1870.....	980	2,618	184	3,782
1871.....	1,056	2,791	174	4,021
1872.....	1,518	3,397	244	5,069
1873.....	2,850	4,354	417	7,621
1874.....	1,933	4,780	201	6,914
1875.....	2,548	5,350	123	8,021
1876.....	3,482	5,499	147	9,058
1877.....	3,898	4,459	108	7,865
Total.....	24,466	54,481	3,325	82,272

The principal articles of domestic production exported from the United States to Hayti and San Domingo during the past two fiscal years were:

Biscuit.....	1876.	1877.
Beef.....	\$24,160	\$28,851
Butter.....	1,283,852	952,792
Other breadstuffs.....	18,004	19,128
Cotton goods.....	256,861	286,248
Drugs.....	15,608	25,155
Manufactures of iron.....	132,522	79,238
Leather manufactures.....	17,998	25,535
Petroleum.....	49,445	66,194
Lubricating oil.....	8,081	46,436
Lard.....	51,628	37,418
Beef.....	25,185	87,137
Pork.....	1,008,340	96,857
Butter.....	96,856	14,085
Cheese.....	14,085	159,513
Lard.....	805,489	679,112
Fish.....	311,272	114,860
Refined sugar.....	102,188	154,816
Leaf and man'ed tobacco.....	166,483	165,035
Lumber.....	196,700	48,867
Woodenware.....	121,911	1,199,241
Other goods.....	1,199,241	600,733
Total.....	\$5,428,583	4,458,870

Under other goods there figured principally, in the two years given, matches, paints, paper, potatoes, sewing machines, soap, candles, carriages and glassware. Hayti received from this country in 1876 domestic goods to the value of \$4,732,724, and San Domingo \$695,859; together, \$5,428,583. In 1877 Hayti received \$3,814,566, and San Domingo \$644,304; together, \$4,458,870.

Referring to the general table showing the trade during fourteen years, it will be observed that the amounts set against the annual periods fluctuate widely. So far as our import is concerned the fluctuations arise from the greater or less yield of the Haytian coffee crop. Coffee is the principal means of payment in Hayti, and whenever the crop is deficient or prices not satisfactory, their export falls off materially. This also affects the import, for whenever the size and prices of the coffee crop permit the Haytians to indulge in luxuries they import on a liberal scale, unless there chances to be a revolution, which paralyzes everything. Little of the coffee remains here, labor being too high to pick it and remove the objectionable stones. Hence the large amounts we receive nearly all go to Havre, Antwerp and Hamburg, arriving there to be sold in transit or reshipped.

Taking a general view of the trade of both republics, they do a much larger business with the United States than with any European country, their principal wants being the necessities of life such as flour, provisions, petroleum, &c., which can be procured nowhere else so cheap or so quickly. Their civilization is of the crudest kind, and it would require half a century of unbroken peace and order to place them on the same plane as the better class of Spanish-American republics.

Some fifteen years ago the Spanish portion, San Domingo, temporarily acknowledged allegiance to Spain, but she was unable to maintain her hold on the Island and the Spaniards left in disgust. Under President Grant's administration the question was in due form placed before Congress, whether it was worth while to acquire the Spanish portion by purchase, but Congress being opposed to this plan of colonization the scheme was abandoned. These weak nationalities, being tacitly shielded from European aggression by ourselves, are like Mexico, left to shift for themselves as well as they can, and the prospect before them is not a bright one. All that we have to do, therefore, is to cultivate business relations with them to such an extent as their political status may permit us to do with a reasonable degree of safety.

Protection for Canadian Industries.

The result of the recent election in Canada, which can be interpreted only as a triumph of the protectionists over the free traders, and promises some important changes in the course of Canadian trade, is received with many expressions of uneasiness and alarm in the mother country. It is quite natural that Canada should be more influenced in this matter by the example of a prosperous next-door neighbor which has found protection of great and permanent advantage, than by the precepts of economists in a country from which she is widely separated and to which she owes only a nominal allegiance. During the past fifteen years the people of the Dominion have seen a phenomenal development of all forms of productive industry on this side of the line, while their own progress in that direction has been slow, irregular and uncertain. They have learned from close observation that the evils which they were led to believe were inevitably attendant upon protection existed only in the imagination of theoretical economists, and that after ten years of unexamined development and prosperity the period of shrinkage and depression found us no more sensitive to adversity than it did the people of Great Britain, who had believed that industry and commerce established on a free-trade basis were founded upon a rock. They have seen that our manufacturers, after supplying their own markets, have pushed successfully for foreign trade, and that in many lines of manufactures we could sell them better goods at less prices than the British manufacturers for export who had previously controlled their markets. They

have seen this country grow rich and great under protection, while Great Britain, tenacious to the free-trade idea, has steadily lost ground in her competition with other nations. With these facts in mind, and far more solicitous for their own welfare than for the business interests of manufacturers and exporters of the "mother country," they have decided that they will try the effect of protection in developing and diversifying their industries. That Great Britain should be alarmed at this utter rejection of her own policy is natural. The *London Times* says:

The victory of the Canadian Conservatives is a victory of protection over free trade. It is no new thing that we unfortunately find our colonies rejecting sound economical doctrine and going back to fallacious reasoning and short-sighted projects, which the intelligence and experience of the mother country have long ago rejected. Sir John A. Macdonald and his party have their way in Canada. They may, perhaps, go as far toward the protection of native industry as Mr. Berry's administration in Victoria has done, but they can hardly go further. A protectionist victory in Canada, however, carries with it an unusual sense of disappointment, and opens up a range of serious apprehension. Canada not many years ago showed much promise of becoming a thoroughly free-trading country, and establishing her prosperity on that solid foundation; but a protectionist reaction, even though its violence may subside in time, though its illusions may be scattered by experience, will leave behind it many obstacles in the shape of watchful, jealous, vested interests antagonistic to any renewed movement in favor of free trade. At the same time, it must be borne in mind that the Canadian policy, unlike the policy of any other colony, either of Australia or South Africa, is liable to aberrations produced by the close neighborhood of a great independent power. When we hear that Canadians have so vehemently declared for protection, we cannot forbear from speculating upon the probable effect of that declaration in the States. Proposals for a customs union embracing the United States and the Dominion, which, as our American correspondent lately informed us, have been attracting attention in Washington, will not probably meet with a much warmer reception from the new ministry that will be formed under Sir John Macdonald than they would have received from Mr. Mackenzie. Protectionists in Canada are at least as jealous of American as of English competition, and the Conservative party have been consistently opposed to any measures tending toward an amalgamation with the Republic. Yet it must be acknowledged that to the mass of people who vaguely hope that protection will bring them relief, the invitations of the Americans may be made to look tempting, and we may see such another sudden, unexpected movement of public opinion as that which gave the protectionists their majority this week.

In our judgment the people of Canada will find their experiences of a judicious protection far more satisfactory than any English newspaper will admit to be possible. When these papers refuse to recognize the benefits already realized by this country from protection, we cannot wonder that they are unwilling to see any good which may result from a similar experiment in Canada. We scarcely look for anything in the shape of a commercial union between the Provinces and the States in the near future. So far as we can see, reciprocity is not now desired on either side of the St. Lawrence; but such an alliance is probable during the next twenty years, with perhaps political union as well. For the present, however, we are content to let our neighbors seek prosperity in their own way. If they find it through protection to domestic industry, they will be at once larger importers and exporters, and we shall not be cut off from the Canadian markets so long as there is no discrimination against American goods.

Pig Iron in the West.

The advance in certain grades of pig iron in the West, which we mentioned in an article some three weeks since as likely to take place, is already a fact. Bessemer pig iron and strictly red-short mill irons have advanced at least 50 cents per ton within the past few days, and the views of the sellers are very decided for 50 cents more. The present price at Pittsburgh for Bessemer pig is \$20 to \$20.50; and strictly red-short forge irons are \$18 to \$19. These, however, are the only grades of pig in which there has been any appreciation in price. Cold-short and neutral irons are still at the old prices.

There are several reasons for this advance. In the first place, it seems as though there was not going to be as much high-grade ore this year as last, and that what there is will be held firmer for the balance of the year. Whether this is a fact or not, there is such an impression abroad, and, under the present circumstances, a suspicion is as good as a fact. Again, it is a fact that there are no stocks of red-short forge irons for sale, and no furnaces are making this grade. At Pittsburgh five furnaces out of the seven in blast are running on Bessemer pig iron, and the other two are making neutral iron. In the Shenango Valley, out of the five furnaces in blast two are making Bessemer, two are run on iron for mills connected with the furnaces, and the other on iron that is neutral with something of a red-short tendency. In the Mahoning Valley the views of those who are making red-short irons (and the amount made is very small) are much above the present market. At Steubenville but one furnace is in blast, and that on iron for the mills connected with it, and at Wheeling but one furnace is making red-short iron. Some mills in the West have small stocks of this grade of iron, but they are rapidly using it up, and there must be a demand increasing every day. This fact makes those who are working on Bessemer pig firmer in their ideas. Their ores are what are needed to make red-short mill irons. They can find a market for all this class of iron they can make, and unless there is more margin between the two grades of iron than at present it will pay better to make forge irons.

It should be understood, however, that

this advance is only in these grades of iron. Cinder pig, if it contains over 25 per cent. of cinder, is still in the "slough of despond." If rolling mill men have to pay higher prices for pig they will have a good article.

One of the most encouraging signs in the iron market in the West is the present condition of the market for old iron rails. During the past six or eight months these have advanced fully \$4 per ton, say from \$18 to \$22. The latter price was offered in Pittsburgh last week for 1000 tons and did not bring them. One of the Western nail mills had about decided to start up and run on old rails, but upon inquiry found that it was doubtful, in the first place, if enough could be procured at any point near enough to the mill to keep it running, and, in the second place, if it would not be cheaper to use the pig from their own furnace. The result was that the mill started on muck bar made from pig.

The reason for this scarcity and consequent advance in price is the increased demand, first, for use in mills in place of puddle bar, and, second, for use in rerolling. It seems almost impossible in some sections to get steel rails at the present time at any price. A superintendent of a Western Pennsylvania railroad told the writer some ten days since that he wanted 700 tons of rails for his track and could not get any steel rails and was compelled to buy iron. With this condition of things this element of uncertainty will soon be out of the way, and the advance in merchant iron that has been established at Pittsburgh and maintained now for several weeks can be maintained at other points.

The New Direct Process at the Brady's Bend Furnace.

We have several times, in short notes, referred to an experiment in the manufacture of wrought iron and steel direct from the ore, now in progress at Brady's Bend, Pa. The process differs in some important respects from those employed in any of the previous attempts to manufacture iron direct, but the information we have, part of it by communication, and part by observation at the furnace itself, leads us to the opinion that the process is at least worth investigation. Wrought iron has been made at Brady's Bend by this process that can be and has been worked into very good horse shoes, nails, bars, &c., though it has not been made continuously, nor as yet on a commercial scale.

The process is carried on in a furnace that in its lines is an ordinary blast furnace some 32 feet high and 4 feet 2 inches in the boshes. The chief peculiarity in its construction is the large number of tuyeres or openings pierced for tuyeres. There are 44 of these. In the well or crucible, which is some 8 feet high by 2 feet 2 inches internal diameter, there are four banks of four tuyeres each, while in the stack above the boshes there are seven banks of four each. The tuyeres in each bank are immediately above each other and some 2 feet apart, so that in the stack there would be four vertical lines of tuyeres, eleven in each line. A bustle pipe surrounds the furnace a little below the boshes, and from this four lines of blast pipes rise to the top of the furnace, corresponding with the lines of tuyeres. At the bottom of the furnace is a balling or reverberatory furnace, into which the product of the process is collected and balled for wrought iron, or is collected in a molten state when cast steel or cast iron is the product.

In operating the furnace it is charged at the top in the usual way. The proportion of flux to ore is the same as in ordinary working, the fuel used being in a raw state either as coal slack or, as the inventor claims, wood uncharred. The blast is turned on and in the first instance enters the furnace at the top or near it, the point of entrance being determined by the character of the ore operated upon. In this way the blast is brought down the center of the furnace, the stock, thoroughly prepared for melting, being deoxidized and, as the inventor claims, carbonized even to the center of the largest lumps charged. As it reaches the crucible thus prepared the tuyeres are turned on and the prepared ore is melted, forming, at the will of the manager, either pig or wrought iron or steel. The aim of the inventor is to keep the furnace above the boshes at from 800° to 1000° F., at which temperature he claims the best results are obtained. Then, by the quick hot-blast at the well, the melting is done. By the peculiar arrangement of the draft and blast this greater heat does not affect the heat of the upper section of the furnace. It is also claimed that by the action and reaction of the furnace the consumption of the fuel is materially reduced, 1900 lbs. of coal slack making a ton of wrought iron. This, it is said, has been demonstrated by the experiments at Brady's Bend.

Two trials have already been made. In the first one the bricks used in the construction were old and could not stand the heat, and the furnace melted at the bottom. From the salamander left, however, some very good wrought iron was taken, as we have before stated. The ore used was a carbonate, from the property of the Brady's Bend Iron Company, known as "Hardscrabble No. 3." It had been mined and exposed to the weather for five years. The lime and coal were also from near the mills, though the coal was better than that formerly used at the Brady's Bend Furnace.

Arrangements are now being made for

another trial under more favorable auspices. At present the process cannot be said to be a commercial success, but it has elements that make it worthy a further trial. If the inventor can do nothing better than make pig iron with a consumption of only 1900 pounds of coal slack to the ton, he will have made a discovery of value for many parts of the country. We shall watch future developments with great interest, and shall give full details and drawings as soon as results are reached which can be accepted as conclusive.

Assignment, Exemption and Collection Laws of the Various States.

Since the repeal of the National Bankrupt Law the business community have a deep interest in knowing the provisions of the various State codes relative to assignments, exemptions, collection of debts, &c. We therefore present an abstract of these laws, which will be found of value for reference by business men:

MAINE.

By the repeal of the United States bankrupt law the old "grab law" is revived in the State of Maine. A debtor may assign all his property for the benefit of his creditors, but he is discharged from those debts only represented by holders who have signed the deed of assignment. The real and personal property of the debtor may be attached in commencing a suit. Married women are not liable for the debts of their husbands. Execution must be levied in thirty days after judgment, which does not constitute a lien on property except by levy, as there are no stay laws; \$50 worth of household furniture, apparel, a certain number of cattle and the necessary provisions being exempt. A homestead not exceeding \$500 in value may be exempted by filing a claim in the office where deeds are registered. As there are no usury laws, parties may contract loans at any rate of interest, although the legal rate is 6 per cent. Six years is the limitation for suits on bills, notes, &c.

NEW HAMPSHIRE.

In New Hampshire the law provides that a debtor may assign all his property for the benefit of assenting creditors, to be equally distributed among them. Those who do not assent to the proceedings (which do not discharge the debtor) still hold valid claims. The limitation for suits on bills or notes is six years. As the property of married women is held separately from that of their husbands, the former are not liable for the debts of the latter. There being no stay laws, executions in order to preserve attachments must be levied in thirty days after rendition of judgment, which does not constitute a lien upon property except by levy. A homestead not exceeding in value the sum of \$500, together with household furniture and apparel to the amount of \$100, and tools of occupation, worth at most \$100, are exempt. Stockholders in corporations are liable only for the par value of the stock for which they have subscribed. Interest in excess of the legal rate of 6 per cent. is forfeited, but the fact that an excessive rate was taken does not vitiate the contract. The effect of the repeal of the United States bankrupt law will be to revive the old "grab law," as in Maine.

VERMONT.

In Vermont an insolvent debtor is not entitled to a discharge from his debts, although he has made an assignment for equal distribution among his creditors, nor does an assignment discharge an existing attachment. A judgment does not constitute a lien on property except by levy, which must follow the rendition of judgment within 30 days. Chattel mortgages hold against other creditors only if the mortgagee is in possession of the property. An important exception to this is found in the case of machinery actually in use, the chattel mortgage covering which can be recorded with the town clerk. The property of married women, being held separately, cannot be made liable for the debts of husbands. Exemptions of household furniture, stock and provisions up to \$200 in value are allowed, and a homestead of \$50 in value is exempt.

MASSACHUSETTS.

There is no assignment law in Massachusetts, and the State code does not recognize assignments. The repeal of the United States bankrupt law does not materially affect the situation in Massachusetts, as the insolvent law of that State is substantially the same. The limitation of ordinary debts is 6 years, but the period is extended to 20 years in the case of a note signed in the presence of a witness, if the same has remained in the hands of the original payee. Executions, which cannot be issued until four days after judgment, must be levied within the period of 30 days thereafter. Articles of household furniture, wearing apparel and provisions not exceeding in value the sum of \$300 are exempt from execution, as is also a homestead worth \$800, provided it is claimed upon the records of deeds or declared in the deed of land. As in the States named above, a debtor may be arrested upon affidavit of the creditor that the debtor intends to leave the State. Massachusetts has no usury laws, and any rate of interest may be contracted for. The legal rate is 6 per cent. In order to form a limited partnership a sworn statement of the amount of capital subscribed by the respective parties must be filed with the Secretary of State.

RHODE ISLAND.

In Rhode Island a debtor may make a voluntary assignment, and an attachment may be defeated at any time within 60 days by such an assignment. A compulsory assignment may be brought about by the petition of at least three creditors, holding at least one-third of the debts, asking the court to appoint a receiver. By the action of a recent law all creditors are brought in and their claims are discharged. The law exempts from execution a variety of personal property, including wearing apparel and working tools to the value of \$200, household furniture and provisions worth \$300 and books not exceeding in value \$300.

CONNECTICUT.

In Connecticut a debtor may assign his property for the benefit of his creditors, which vacates all attachments and levies of executions made within 60 days. A creditor holding a claim exceeding \$100, or a creditor of the State holding more than \$100 against a non-resident owning property in the State, may bring about a compulsory assignment. In either case the judge of the Probate Court appoints a trustee and commissioners to examine and report upon the claims. All the property of the debtor is put into the hands of the trustee. The court may discharge the debtor when he has paid 70 per cent. of the claims proved. The articles and property exempted are numerous. They embrace household furniture, wearing apparel, bedding, military equipments, pension money, tools and library to the amount of \$500, live stock and provisions worth \$200, a physician's horse, buggy, &c., and one boat for oyster or other fishing to the value of \$200.

NEW YORK.

New York has an assignment law by which a debtor may, for the benefit of his creditors, assign his property to an assignee, who must file a bond. This assignment must be acknowledged and recorded in the office of the clerk of the county. If the creditors sign a composition deed the debtor is discharged, which does not, however, release the claims of those creditors who have refused to sign the deed. The assignee realizes on the property of the debtor, and divides the proceeds among the creditors *pro rata*. Household furniture or library to the value of \$50, live stock and tools to the amount of \$25, and if the debtor be a householder, team and tools valued at \$150 in addition are exempt from execution, which may be proceeded with at any time within five years after judgment. If a claim for homestead exemption has been duly filed in the office of the clerk of the county in which the property is located, homestead to the value of \$1000 may be claimed. If interest beyond 7 per cent. is paid, both principal and interest is declared forfeit to the debtor.

NEW JERSEY.

In New Jersey the law provides for the assignment of a debtor's property to an assignee, who may realize upon it after filing a list of the creditors within three months after the publication of a six weeks' notice. Creditors not presenting claims obtain a share only after others have been paid in full. By proceedings under the act, creditors' claims are discharged whether they are residents or not. The exemption law secures for the debtor personal property worth \$200, and to a householder with family a homestead to the value of \$1000. The usury laws of New Jersey provide for the forfeiture of all interest above the legal rate of 6 per cent.

PENNSYLVANIA.

In Pennsylvania there is no compulsory assignment law, but a debtor may assign his property for the benefit of his creditors, who obtain a *pro rata* share of the amount realized on any claims proved before the last dividend from the estate has been paid. The only preferred creditors are employees, the maximum amount being \$200 if their services were rendered within a specific time before the date of assignment. As soon as a debtor has assigned his property no execution can be levied on it, but the fact that he has done so does not, however, discharge the claims of his creditors, the unpaid balance of the debt being still due to them, subject to a limitation of six years on ordinary suits. Although in Pennsylvania a married woman holds her property separate, she is liable for debts incurred by her for the support of the family in case her husband's estate cannot satisfy the debt. The creditors of her husband have also a claim on her earnings, which by law belong to him. If the owner wishes to take the benefit of the law he is entitled to an exemption of \$300 worth of real and personal property, all wearing apparel remaining his property. The law does not provide for a homestead exemption. Stockholders in corporations whose charters are now granted by the governor and the courts are individually liable to the amount of stock held by them.

DELAWARE.

Assignments in Delaware are not compulsory. In other respects the law is similar to that of Pennsylvania, and, as in that State, the debtor's voluntary assignment does not discharge him from the amounts not satisfied. No creditors are preferred. The exemptions are small in amount, being \$75 for single men and \$200 for the heads of families. As in Pennsylvania, no homestead is secured to the debtor by law. In general, corporations are chartered by the legislature, the term of the charter being only 20 years. The usury laws of the State prohibit a rate of interest greater than 6 per cent., under the penalty of loss of the entire amount loaned.

MARYLAND.

The repeal of the United States bankrupt law will have very little effect in Maryland, as the State law is substantially the same. A debtor, in assigning his property for the benefit of his creditors, may prefer one over another. There is no provision for a homestead exemption, but wearing apparel and tools are secured, together with personal property to the value of \$100. Unless a promise to pay has been given the period for the limitation of a debt is three years. A stockholder of a corporation can only be held liable for the unpaid balance of his subscription of stock.

WEST VIRGINIA.

The custom in West Virginia, which has no insolvent law nor any assignment law, allows a debtor to convey his property for the benefit of his creditors to a trustee, but the proceedings do not discharge him from the unpaid balance of the claims of his creditors without their consent. Under specified restrictions a homestead worth \$1000 may be claimed, and the head of a family may retain from a forced sale real or personal property which shall not exceed in value the sum of \$200. Interest above the legal rate of 6 per cent. cannot be collected under the law, but there is no penalty beyond the loss of the unlawful excess.

OHIO.

In Ohio there is a voluntary assignment law, under the provisions of which a debtor

may turn over his assets to an assignee in trust for the benefit of his creditors, whose claims are not discharged by the proceedings. The assignee must, after due notification, sell the property either at public auction or under certain restrictions at private sale, and make the first distribution before the end of eight months. Arrest for debt is possible only on an affidavit setting forth that the debtor is about to fraudulently realize, secrete or remove his property. The debtor may be discharged on a certificate from a commissioner of insolvents by transferring his property to him. In all cases employees are preferred to the maximum amount of \$100. The exemption law secures for mechanics, farmers, draymen and professional men their tools, implements, stock, &c., to the value of \$100. The homestead law provides for the exemption of a homestead worth \$1000 to every family, or in its stead \$500 in personal property, which, however, is beyond the reach of a claimant if either wife or husband is in possession of a homestead. The law of Ohio does not permit a married woman to mortgage her estate without the consent of her husband, although otherwise the wife has full power over her property.

ILLINOIS.

In Illinois an assignee, who must file bonds for double the value of the estate as presented under oath in an inventory by the debtor to the county court, notifies the creditors by publication. Those who have failed to present and prove claims after three months' notice are debarred from a share in the dividends until the creditors who have entered claims are paid in full. Assignment proceedings do not discharge the debtor. Wearing apparel and personal property to the value of \$100 are exempt, together with a homestead worth \$1000. Stockholders in corporations are liable for the amount of stock subscribed but not paid for. Usury entails the loss of the entire interest, but by special contract to per cent. may be collected.

INDIANA.

In Indiana if a debtor assigns all his property to his creditors and is able to obtain their consent to a discharge, he is released from further liabilities. A \$1000 homestead and \$300 worth of personal property, to be selected by the debtor, are exempt.

MICHIGAN.

The assignment law of Michigan permits a debtor to deliver his property for the benefit of his creditors and to obtain a discharge from his liabilities. Mechanics' tools and farmers' implements, valued at less than \$250, a specified number of cattle, furniture worth less than \$250, and wearing apparel, library, &c., to the value of \$150 are exempt. The homestead law secures for an insolvent debtor a lot and house in a city, or forty acres of land in the country, provided their value does not exceed \$1500. The statute of limitations fixes six years as the time in which debts on accounts, notes or bills may be collected.

(To be continued.)

Scientific and Technical Notes.

In a paper read by Dr. J. L. Phipson, before the British Association at Dublin, he calls attention to a

NEW WHITE ZINC PIGMENT.

On the basis of which is a sulphide of zinc. On submitting this new product to a careful examination it was found that it not only surpasses the old zinc white (oxide of zinc), but that it is superior in every respect to carbonate of lead itself. It is obtained by precipitating chloride or sulphate of zinc by means of a soluble sulphide. Sulphides of sodium, barium or calcium have all been used for this purpose, and special precautions are taken lest any iron that may be present in small quantities as an impurity in the zinc solution should be precipitated with the white sulphide of zinc. The precipitate being collected and dried is transferred to a furnace, where it is calcined for some time at a cherry-red heat, and carefully stirred so as to bring all parts of it successively in contact with the air. It is then raked out while quite hot into vats of cold water, where it is levigated, and afterward collected and dried. The result is a white pigment of exquisite beauty; its covering power when mixed with oil is greater than that of any substance hitherto discovered, being about 25 per cent. higher in this respect than that of the same weight of pure carbonate of lead. According to analyses of this new product, made by Dr. Phipson, it consists of an oxisulphide of zinc, the composition of which varies somewhat according to the duration of the calcination and the exact degree of heat obtained. Hence, it is not an easy matter to get it precisely of the same composition at each successive operation. Nevertheless, this point is attained quite closely enough for all practical purposes. The best product appears to correspond very nearly to the composition $2\text{ZnS}, \text{ZnO}$, but, occasionally, a somewhat larger proportion of oxide is produced. Of course a white pigment of this nature is not liable to darken in color by sulphuretted hydrogen emanations, as occurs with white lead; but it has also the advantage of not proving prejudicial to the health of the workmen who manufacture or use it.

An interesting instance of the variety of the products obtained by modern effort to utilize waste material is given by the Paris correspondent of *Iron*, who describes the method employed by Eugene Assolin, of St. Denis, in

UTILIZING OLD AXLE GREASE FROM RAILROADS.

By boiling in kettles holding three tons each, straw-colored fatty acids are first obtained, which are principally used for the manufacture of stearic acid by distillation and for making soft and hard marbled soaps. After the separation of the fatty acids, a secondary material, metallic sub-soaps, is obtained, which, treated with soda, gives hard soaps known as bronze soap. The residue from this saponification contained, as a mean of the analyses, twelve different lots, running from 24,000 to 44,000 lbs. each, of the following substances: Copper, 14.70; iron, 8.10; fatty matters, 4.20; silica, 1.50; and water, 71.0. They are treated with sul-

phuric acid and yield mixed sulphates of copper and iron.

Professor B. Silliman, in a letter to the *Engineering and Mining Journal*, mentions a

NEW ALLOY FOR SUBSIDIARY COINS.

exhibited at Paris by Messrs. Johnson, Matthey & Co. It is an alloy of 98 per cent. of aluminum and 2 per cent. of nickel, and is offered as a substitute for the copper-nickel coins now in use. In color it is almost as white as silver, for which it might easily be mistaken except for its extraordinary lightness. Its weight (only 2.75 density) would at once prevent its being mistaken for silver or any other metal. The head of the Queen on one side, with the legend, "Victoria-Queen," shows how well it is adapted to receive a sharp impression. It would be impossible to counterfeit this coin without the use of aluminum, which is a metal sufficiently scarce and difficult to obtain to discourage frauds of this kind, while it is yet sufficiently abundant to meet the requirements of coinage. It does not tarnish by handling or exposure to the gases which blacken silver and bronze, nor has it any disagreeable odor. It is as hard as silver, but not so hard as German silver (our "nickels"), which is an advantage in the ease and beauty of coinage. Whether it will meet all the requirements of subsidiary coinage, only a practical test in actual use can determine, but its beauty and lightness commend it to a trial.

Professor B. Silliman in a recent correspondence from Paris mentions a

CURIOUS CASE OF DEBASED COINAGE.

A large number of spurious doubloons were uttered by one of the Peninsular governments during the late civil wars, the nucleus of which was a disk, or blank, of platinum, which was inclosed between faces of gold, the blow of the coining press concealing the fraud, while the weight of these spurious pieces was identical with the genuine coin; the value, however, of the platinum being about one-third that of the gold coin it represented. These platinum blanks had been prepared by the Russian government for use in the suppressed coinage of that metal.

Professor A. Wagner describes in the *Bayerisches Ind. u. Gew. Blatt* an

AUTOMATIC REGULATOR FOR EVAPORATING OR DISTILLING LIQUIDS.

the merits of which will be appreciated by analytical chemists and pharmacists. He places the dish or retort containing the liquid to be evaporated or distilled in a ring attached to one end of a scale beam, while the other carries weights chosen to suit the case. By a lever action from the beam, a cock controlling the supply of gas to a Bunsen burner is closed as soon as the vessel contains only the amount of liquid required.

An important paper was read lately before the British Association by Prof. C. Forbes, on an

INSTRUMENT FOR INDICATING FIRE-DAMP

in mines. The instrument consists of a resonator of variable dimensions and a tuning fork of definite pitch. The resonator is a metal tube, 1 inch in diameter and 14 inches long, in which a piston slides, so as to regulate the length of the tube. This tube is fixed to a block of wood, to which is attached a tuning fork whose points are just above the open end of the tube. The tuning fork is sounded in a very convenient way, and the piston is moved until the proper length is found, which is indicated by the resonator intensifying the sound of the tuning fork. Barometric pressure produces no difference on the instrument. The temperature correction is made by reading off a thermometer of the proper dimensions instead of reading off a fixed mark on the piston. The only error is by the presence of dense carbonic acid gas, but carbonic acid gas tends to destroy the explosive character of fire-damp, and it appears that if the presence of carbonic acid prevented the instrument from indicating fire-damp it would certainly be sufficient to prevent the explosive character of fire-damp.

A committee of the British Association, consisting of Sir William Thomson, Profs. Tait, Balfour, Stewart, Joule and Maxwell, have made a report on experiments on the

MECHANICAL EQUIVALENT OF HEAT.

The new result, confirming the earlier researches of Prof. Joule in 1850, gives 772.55 foot-pounds as the equivalent at the sea level, and the latitude of Greenwich, of the heat which can raise a pound of water weighed in vacuo from 60° to 61° Fah. in a mercury thermometer where the permanent freezing point is called 32 and the permanent boiling point of water is 212. The work at present in hand is the more accurate investigation of the true position of the freezing point and the boiling point of the thermometer when cleared from the effects of the imperfect elasticity of the glass of which it is composed. The correction of the above equivalent which may thus accrue is not expected to be of considerable amount.

Prof. Everett, in his report of the labors of a committee of the British Association, describes a

NEW METHOD FOR OBSERVING UNDERGROUND TEMPERATURES.

To avoid the inaccuracies caused by the fluctuations of heated water in the bottom of open bore holes, a thermo-electric method for closed bore-holes was introduced. Two wires, one of iron and the other of copper, each covered with gutta-percha, are joined at both ends, where a portion is left uncovered. One junction is buried in the bore, while the other remains above ground available for observation. A current flows through the circuit composed of these two wires whenever the two junctions are at an unequal temperature, and the observer immerses the accessible junction in a basin of water containing a thermometer, and regulates the temperature of the water until he finds by a galvanometer that no current passes. He then knows that the temperature of the water, as indicated by the thermometer, is the same as the temperature of the buried junction. The operation involves the complete filling up of the bore, as several circuits are employed, their lower junctions being buried at different lengths.

Nitroglycerine, which is made by the admixture of glycerine with nitric and sulphuric acids, and subsequent washing to re-

move waste acids, is apt to decompose, even when cold water is used. In order to avoid deterioration, Mr. Frederick Mann of Korot Creek, Victoria, has made the following

IMPROVEMENTS IN THE MANUFACTURE OF NITROGLYCERINE.

It consists in first crystallizing the nitroglycerine by freezing before attempting to separate it from the acids, and then separating such crystals from such acids by a centrifugal washer, such as is used for the separation of sugar crystals from molasses, or by any other of the machines now in use for separating a crystal from a liquid. The crystallized nitroglycerine thus obtained he then places in cold water, when it liquifies and sinks to the bottom, from whence it can be drawn and used for any purpose.

The *English Mechanic* describes and illustrates a

NEW NUT-TAPPING MACHINE.

patented by Mr. T. Mason, of Birmingham. The machine consists of the usual framework, with driving shaft and gear. It is fitted with a long box chuck, or hopper, in which the blanks are placed; the tapping tool is fixed at the lower end of this chuck and is started by means of a cam. As each nut is tapped the tool is withdrawn by means of a balance weight, freeing the nut from the chuck, when another blank falls into position for tapping, and so on until the chuck, or hopper, is empty. In front of the chuck there is a slide guide worked by a lever from the balance weight, which is to prevent the twisting or dropping of the nut from the chuck until the tapping tool is restarted.

G. Larsen gives the following method for

SEPARATING COPPER AND ZINC BY SULPHURETTED HYDROGEN

by precipitating one only. He moistens the precipitate of sulphuretted hydrogen on the filter with hydrochloric acid of 1.05 specific gravity, through which sulphuretted hydrogen has been previously passed. After moistening, the filter is washed with sulphuretted hydrogen water.

In the Belgian Department at the Paris Exhibition, J. Montagne & Co., of Mons, exhibit P. Cucherat's patent

WIRE SPRING MACHINERY.

The wire is first seized by a pair of rollers, one of which has a groove and the other a corresponding milled projection. It is passed under a guide roll, the position of which may be adjusted according to circumstances, and is then carried between a second roller and a guiding sheet which throws it forward. The position of the guide roll determines the diameter of the spiral spring, while the deviation of the second roller and guiding sheet from a position parallel to the first pair causes the spring to become spiral. This deviation is automatically regulated, and the machine is so constructed that when a double spiral has been finished the wire is cut at the proper time.

The *Moniteur Industriel* states that A. Olivier-Matthey, of Neuchâtel, has succeeded in

REPRODUCING THE PHONOGRAPHIC RECORD, which, it is well known, becomes indistinct after the phonographic plate has been frequently used. He attaches one end of a copper wire to the tinfoil and the other to a zinc cylinder, which is placed in a porous cell containing water acidulated with sulphuric acid. The whole is then plunged into a saturated solution of sulphate of copper. After three days the deposit of copper on the tinfoil is so thick that as many galvanoplastic impressions as are required may be taken from it, which are by far more durable and admit of unlimited reproduction.

A new material, exhibited in numerous applications at Paris, and which promises to become important, is the so-called

CORK LEATHER.

it consists of very fine slices of cork, which are placed between layers of any kind of cloth, to which they are firmly attached. Messrs. De Beeres & Co. have succeeded in preparing the slices so thin, pliable and sound that the cloth does not lose any of its softness and is not made appreciably heavier, while at the same time it possesses the advantage of being impervious to water.

In the *Berichte d. Deut. Chem. Gesell.* is a method for

PURIFYING PLUMBAGO

given by Bessel. He mixes it with 1 to 10 per cent. of grease, petroleum or paraffine and boils it strongly in water. This causes the pure plumbago to rise to the surface of the water. It is skimmed and dried.

Mr. George M. Hopkins has invented a very simple and delicate instrument,

THE MICRO-TELEPHONE.

It consists of two springs secured to a small base piece, each supporting at its upper end a piece of ordinary battery carbon. The two pieces of carbon are placed in light contact, adjustable by a screw passing through one of the springs at or near its center. The two springs are put in an electrical circuit in which there is a receiving telephone of the Bell type. When mounted on a sound-board this micro-telephone will transmit articulate speech uttered in any part of a room of ordinary size; it will transmit the music of a piano and even the turning of the music may be heard.

Mr. McCook, member of the Academy of National Science of Philadelphia, has discovered

HOW ANTS DISTINGUISH EACH OTHER.

It appears that in the battles which ants of the same species often wage together, difference of odor constitutes the means of discriminating friend from foe. Mr. McCook collected a number of combatants and placed them in a glass jar upon some soil. The battle was continued, and when it was again at its height a pellet of paper saturated with cologne water was introduced into the jar. The effect was instantaneous. The ants showed no signs of pain, displeasure or intoxication; indeed, some ran freely over the paper. But in a very few seconds the combatants had unclasped mandibles, released their hold of enemies legs and bodies, and, after a momentary confusion, began to burrow galleries in the earth with the utmost harmony.

AMERICAN SCREW CO.,

Providence, R. I.,

**MANUFACTURERS OF MORE THAN 4000 VARIETIES OF PRODUCT,
AND INCREASING THE ASSORTMENT DAILY.**

Machinery employed contains important inventions recently patented, and which are designed to produce Screws at a **lower cost to the consumer** than has ever been attained.

All goods are distributed through the Hardware trade, to whom a liberal discount will be allowed.

INTERNATIONAL EXHIBITION. PHILADELPHIA, 1876.

(No. 235.)

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.

PHILADELPHIA, November 8, 1876.

REPORT ON AWARDS.

Product: Iron, Brass and Steel Screws, Tire and Stove Bolts, Rivets.

Name and address of Exhibitor: American Screw Company, Providence, R. I.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award, for the following reasons, viz: **Being of a quality nearly approaching perfection, showing the highest attainment in this branch of manufacture.**

G. L. REED, Signature of the Judge.

Approval of Group Judges,

Daniel Steinmetz,
Jas. Bain,
Chas. Staples,

G. L. Reed,
J. D. Imboden,

J. Diefenbach,
Dav. McHardy.

A true copy of the record. FRANCIS A. WALKER, Chief of the Bureau of Awards.
Given by authority of the United States Centennial Commission.

[L.S.] J. L. CAMPBELL, Secretary.

A. T. GOSHORN, Director-General.
J. R. HAWLEY, President.



After forty years' experience we offer to the trade our Centennial Screws, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at the same price as the old style screw.

The new screws will be packed in manila colored boxes with the new label covering end of box, and enlarged figures showing plainly contents.

To distinguish this screw we have adopted a trade-mark, which is also secured to us.

The accompanying engravings show the progress of making screw from the old blunt point to style now adopted.

Experience has shown that the weak point of screws, as formerly made, is at the heel of the thread, where all

1776.



1846.

Patented August 30.



Section at Line A B

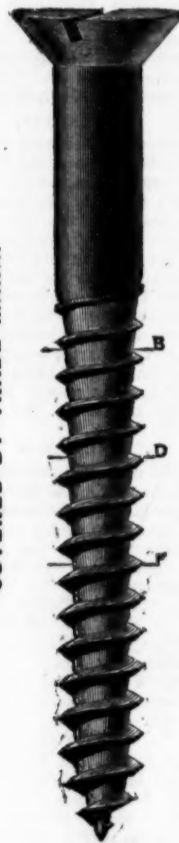
Section at Line C D

Section at Line E F

1876.

Patented May 30.

COVERED BY TRADE MARK.



Section at Line A

Section at Line C D

Section at Line E F

Estimated to be FIFTY PER CENT. stronger than a Screw as Commonly made.

the strains of forcing the screw into the wood naturally concentrate.

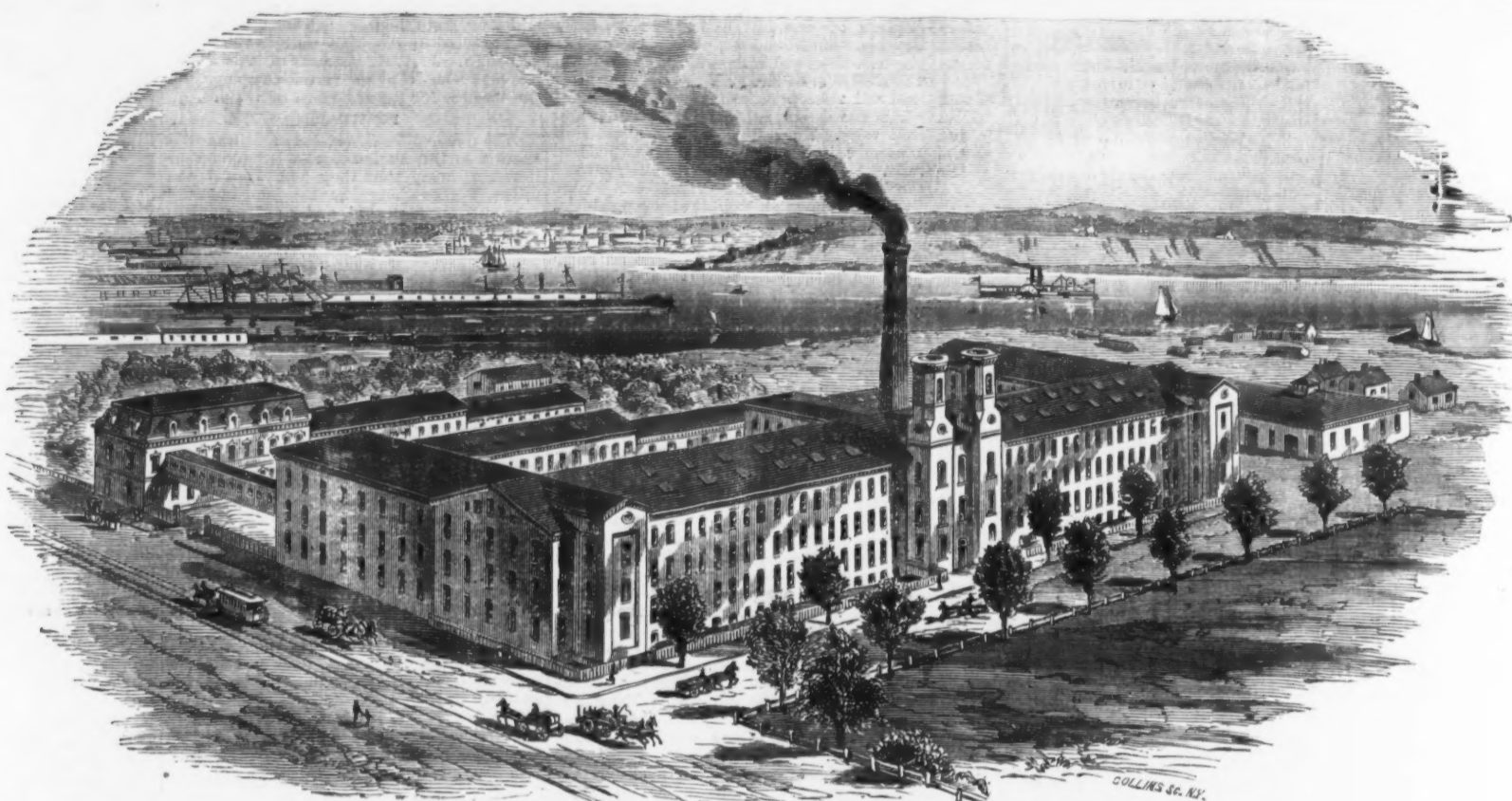
To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated. See sections at lines.

CLAIM.

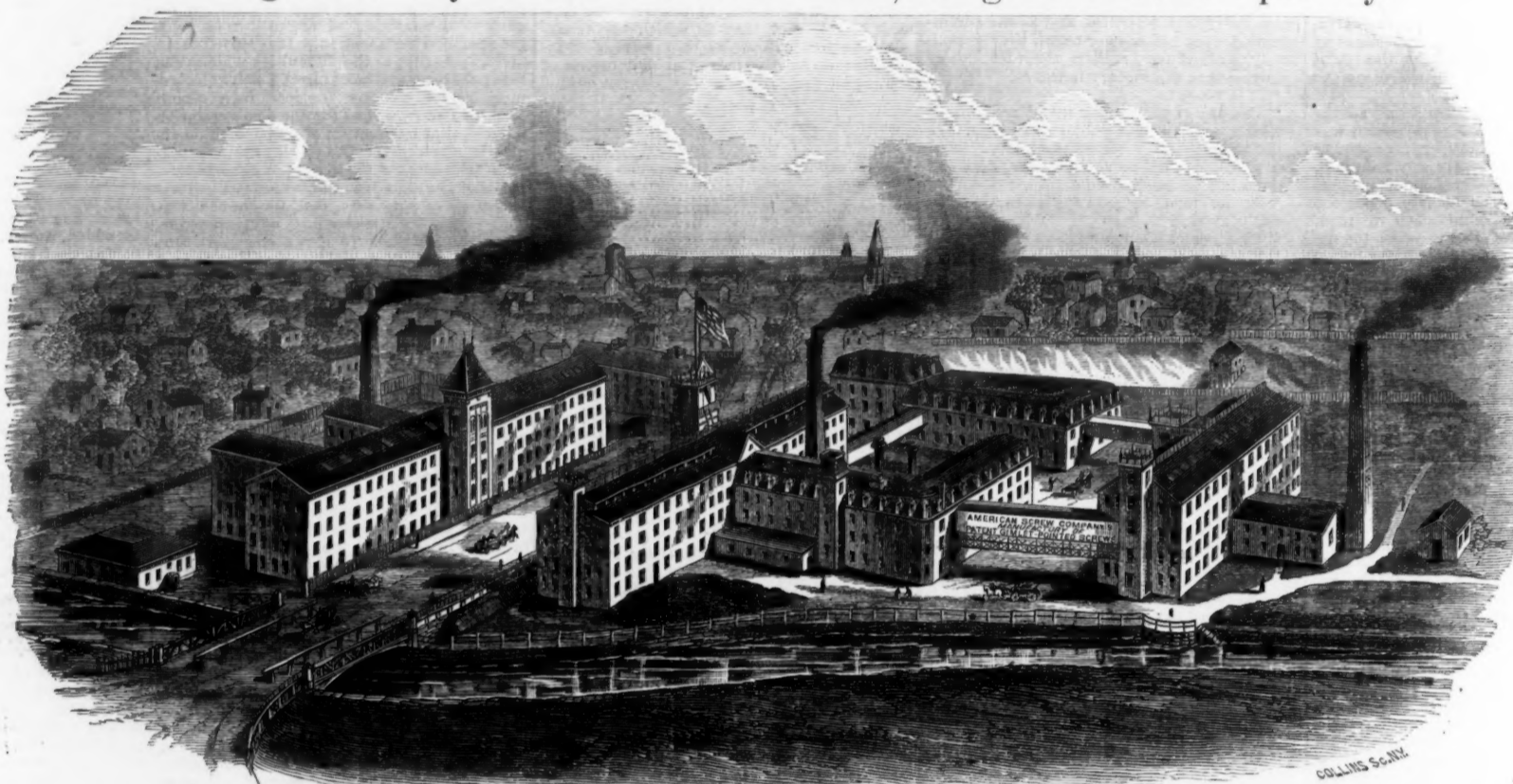
"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

On the opposite page will be found illustrations of the various Works of the company.



NEW ENGLAND MILL.

Containing Machinery for the Production of 22,500 gross of Screws per day.



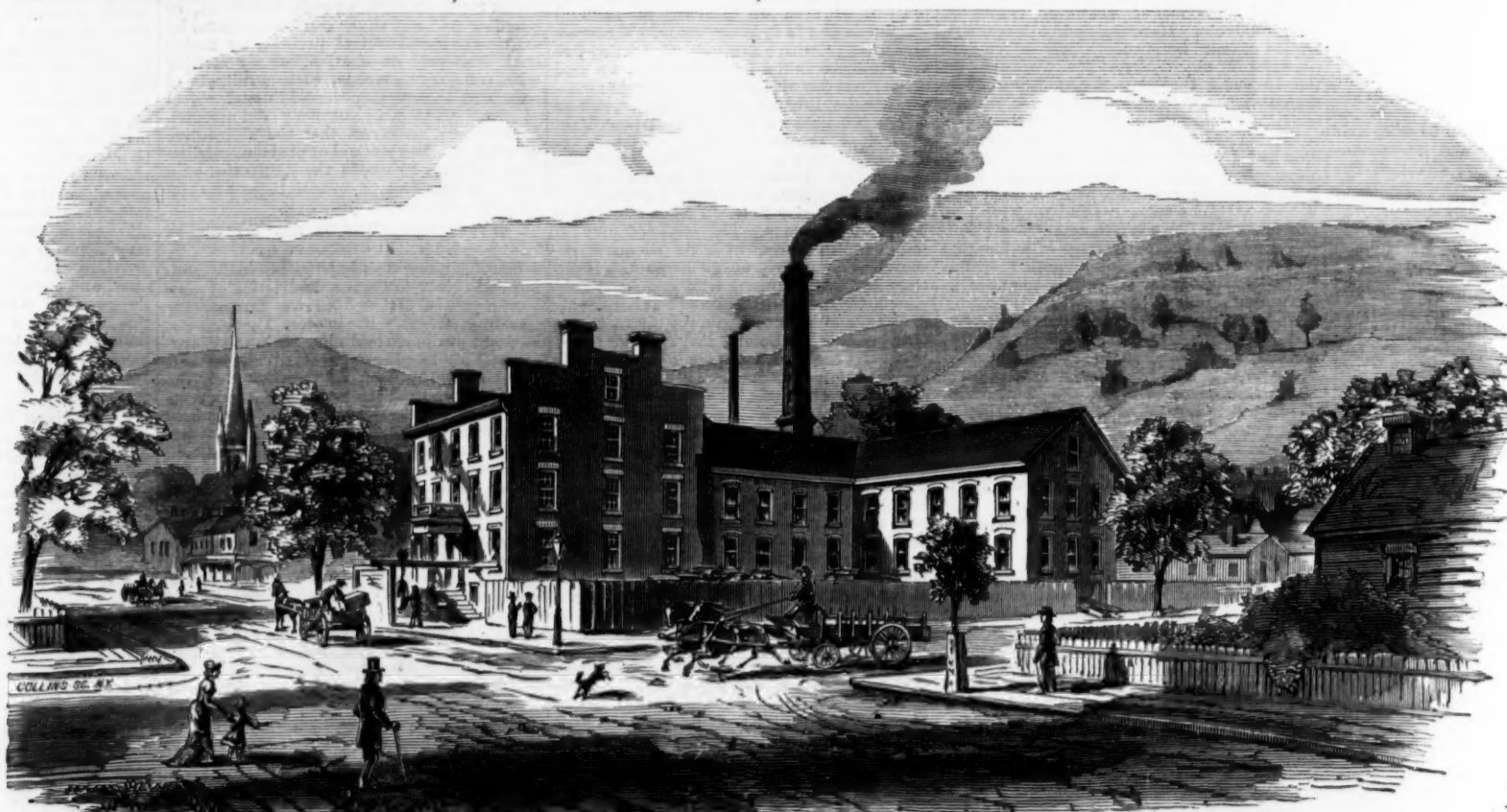
BAY STATE AND EAGLE MILLS.

BAY STATE MILL,

For the Production of Stove Bolts, Tire Bolts, Rivets,
Lock and Machine Screws, &c.

EAGLE MILLS.

Capacity 22,500 gross Wood Screws per day.



WORKS AT DUNDAS, ONTARIO, CANADA.

Capacity, 4000 gross Screws per day.

THE PARIS EXPOSITION.

French Newspapers and the Exposition.

(From our Special Correspondents.)

THE IRON AGE.
B. 3, American Section Exposition Universelle,
PARIS, Sept. 11, 1878.

It is amusing to observe the different manner in which the various French journals treat every subject connected with the Exposition, according to which political party they belong to. This Exposition being the idea of the Republicans, and carried by Republican votes almost entirely, whatever is Bonapartist, Monarchical, or in any way anti-Republican has been its enemy from the commencement, opposing every step and making the best use of every opportunity for ridicule and hostile criticism. This Exposition is regarded as a Republican demonstration, while that of 1867 was considered an imperial fête, and the public and the press are divided into two opposite and hostile camps in championship of one or the other. This feeling even goes so far that the action of May 16 last year has been said by some to have had no other object than to discourage both foreign governments and French citizens from preparing for the Exposition—a very extreme opinion, but held by some. It thus happens that the organ of the government, the *Journal Officiel*, the Republicans now being in power, takes pleasure in making the following comparison of the receipts of admission to the Expositions of 1867 and 1878 for the week included between Aug. 29 and Sept. 4 of each year:

"In 1867, the total number of visitors (including supplements for study hours and for admission to the gardens) was 287,319.

"In 1878, that number amounted to 537,107.

"The difference in favor of 1878 is therefore 249,789 admissions.

"Up to the 4th of September inclusive, the total admissions to the Exposition of 1867, extending back as far as the 1st of December, 1866, had produced 6,492,592 francs 95 centimes.

"Up to the same period the total admissions to the Exposition of 1878, which was opened only on the 1st of May, are represented by the imposing sum of 7,412,219 francs 70 centimes, making a difference of 929,626 francs 75 centimes, or nearly 1,000,000 francs in favor of the Exposition of 1878. The daily average of the receipts for the week ended Sept. 4, 1878, was 76,720 francs 57 centimes. The daily average of the receipts since the opening was 58,363 francs 93 centimes."

To comparisons like the above the anti-Republican journals reply that the amount expended on the Exposition of 1867 was less than 23,000,000 francs, while for that of 1878 the expenditures are already more than 49,000,000, and not yet over. Thus one of them remarks: "In 1867, by the 4th of September, the receipts had covered more than one-fourth of the expenditures, while this year, at the same time, they had scarcely reached one-seventh of the cost." And about a column and a half on this text. The *Figaro*, anti-Republican, ventures a criticism, with which most of the exhibitors will agree, of the postponement of the announcement of awards, and closes its article with its explanation of the large proportion of awards given to some foreign countries:

"M. Krantz is master at the Exposition, notwithstanding what an anonymous correspondent writes me. So true is it that M. Krantz is master that he defied the ministry of the 16th of May. Like a captain on board his vessel, he is master at the Exposition after God. Ask M. Teisserenc de Bort, whom he causes to tremble even in the Morocco of his portfolio. Ask the sub-Krantzes, the group chiefs and class chiefs; they will tell you that they have always done as M. Krantz wanted them to, because he never permitted them to deliberate except on questions where their vote was a necessity. And while we are on the subject let me speak once more about the distribution of awards and its delay. It was M. Krantz who wanted an extraordinary ceremony, a procession and the presence of the chambers; he hoped to drown the fiasco of the opening in the solemnity of the end. The ministry did not want a fête; they still remembered the disorders which followed the 30th of June; but M. Krantz brought in the intervention of the high personages of the Republican party. Then he was irritated by the opposition which he encountered among practical people, and the fête of the distribution of awards became with him a disease, a fever, a rage.

"He wants his fête! He will have it! In vain he has been shown the *Double Liégeois*, which announces doubtful weather for the 21st of October; and the *véritable Mathieu Loensberg*, which predicts a tempest and torrential rains for the same day, M. Krantz answered by showing the *Almanach du bon Républicain*, which promises both sun and cool weather for that solemn occasion.

"I shall have my sun of Austerlitz," says the King of the Trocadéro crossing his hands behind his back.

"The list of awards is almost entirely known. M. Krantz cannot refuse a favor to a colleague of the senate; the group have their friends—the class judges have theirs also. All the jewelers, all the goldsmiths, all the machine builders know what they have. Are these not the classmates of the Ecole Centrale, the classmates of the Ecole Polytechnique—and my friend Z—and my friend Y—?"

"At the present moment the exhibitors who know nothing are those—who have nothing. Twenty-nine thousand secrets cannot be kept three months when 2000 people know them."

"Everybody is aware that at the Exposition the lion's share has been allotted to the foreigners. We have been generously and exquisitely polite. We have done better than the *Messieurs les Anglais*, tirez les premiers,* of the guards at Fontenoy. We said to the foreigners: 'Take all you want.' And they took all they could. I have explained how in several classes the foreign

jurors very ably defended their interests, and how our countrymen, modest manufacturers or simple Republicans, had had neither authority enough nor science enough to defend their own constituency.

"These latter have, therefore, in almost all cases been sacrificed!

"We shall console ourselves by thinking that this will establish our reputation as the most polite people on earth, and will at the same time allow us to rival the Scotch for the renown of being the most hospitable people of the civilized world."

But criticism of M. Krantz and of the Exposition only stirs up the Republicans, and they reply in articles like the following from the *Excelsior*:

"It was said yesterday that M. Krantz had withdrawn his resignation. So much the worse! croaked the Bonapartist papers like disappointed crows. Why? so much the worse! Do they know! M. Krantz is not liked by the party of the plebiscite. This is natural; he is a Republican.

"But even though he be a Republican he cannot leave a post as important as that of Commissioner-General without some serious motive.

"The desire to please one's adversaries—even when they are unscrupulous—is not sufficient. What motives, then, are alleged by the—admirers of the bazar of 1867! They reproach M. Krantz with being arbitrary.

"Do you not think it singular that this argument should come from the Cæsarean camp!

"That we should complain of despotism can be understood.

"But they! * * *

"How has M. Krantz shown himself so arbitrary that it becomes necessary on the eve of the close of the Exposition to deprive ourselves of his valuable services?

"Here the enemies of the Commissioner-General are rather embarrassed.

"They formulate vague complaints, but so far they have specified nothing or next to nothing.

"They invent reasons. In truth, they compose violent diatribes, and as the administration does not answer them, they gratuitously assume—or, rather, they let others believe—that the victory is theirs.

"It is pitiful.

"The day of the settlement of accounts is drawing near and the public will judge. We certainly do not pretend that everything has gone just as it should, nor that M. Krantz has committed no errors.

"But let men in good faith examine the result obtained.

"That result is splendid.

"If the exhibitors had been better agreed,—if certain old fogies had been less lukewarm—many difficulties would have been overcome."

"But what can be done with enemies always in the way and always seeking without truce or mercy to prevent success.

"The clamors of the enemies of the Republic probably do not move M. Krantz, and we still believe that the Commissioner-General will make some concessions to those of his exhibitors who in good faith bring him serious claims.

"At all events M. Krantz will remain, and outside of a few criticisms of details, all good Frenchmen will give him credit for the way in which he has acquitted himself of his task.

"As for you Bonapartist gentlemen, you will have your trouble for your pains.

"You may say what you like, and do what you will, you cannot prevent the Commissioner-General from having two master qualities, which will cause all his minor errors to be forgotten.

"M. Krantz is a savant.

"M. Krantz is an honest man.

"A savant! Do you understand?

"An honest man! Do you hear!"

Foreign Exhibits.

RUSSIA.

Although the Russian machine exhibit occupies a tolerably large section of the foreign machine gallery, it does not include a great deal of machinery. About one-third of the section is taken up with the exhibits of three of the Russian technical schools—the Technological Institute of St. Petersburg, the Imperial Technical School of Moscow and the School of Arts and Trades of Tcherchepovetz. Here we find a large collection of hand tools and models of various portions of machinery. The workshop of the Imperial Technical School has sent a number of engines, steam pumps and various machine tools. The Bellino-Fenderich Works of Odessa are represented by a portable engine and a small horizontal engine. A 50-horse-power engine with patent valve gear is exhibited by Scholtze, Reppau & Co., of Warsaw. Some sugar machinery is sent by Lillo, Rau & Lowenstein, and Edward Gencello Solowka has the drawings of a horizontal hydraulic press of his invention, with a special apparatus for separating the fiber in the manufacture of beet sugar.

The kinopansigraph and the othotachymeter are apparatuses for making graphical records—the former of the speed, stops and manœuvres of a railroad train, and the latter of the degree of smoothness with which a train runs, and consequently of the condition of the track. Joseph and William Gratiaux, of Moscow, are the patentees. Gustave List, of Moscow, has some pumps and fire engines, and Adolph Troetzer, of Warsaw, also exhibits fire engines. It is needless to add that these are hand, not steam fire engines.

The Russian mineral resources are well represented. In various parts of the section we find lumps of bituminous and anthracite coal, principally from the mines of Southern Russia. Besides two lumps of anthracite coal (about 5 feet cube) exhibited by the Dombrowa coal mines, there is a model, on a scale of one-tenth, showing the disposition of the galleries and the method of working these mines. The Russian ores are found in cases along the wall separating the machine gallery from the main hall, and in a portion of the main hall are to be found the ores of Poland, Ural and Russian Turkestan. These collections are quite complete. The iron ores consist chiefly of red and brown hematite and specular ore. Besides these we notice considerable lead, manganese and copper ores.

P. Goujon and N. J. Koltchine make large displays of wrought nails, and N. & M. Boutine, of Natchinsk, Siberia, exhibit stove castings and hollow-ware. The Nijne-Taguitak Works have a large assortment of iron and steel bars and plate, samples of which are shown, subjected to both hot and cold tests. They have also a number of Bessemer steel, open-hearth steel and puddled rails. In the wide passage which separates the Russian from the Austrian section we find a monumental exhibit of wrought-iron pipe made by Geo. Chavdior, of St. Petersburg, and a display of Siberian graphite, from the celebrated Alibert Mines of Bata-goul. A small portion of the Russian Machine Gallery is devoted to Finnish exhibits. The only machinery we find here is some sent by W. Crichton & Co., of Abo. He has a steam pump, a 5-horse-power engine with boiler, and a steam winch.

HOLLAND AND THE DUTCH COLONIES.

A very interesting feature of the Dutch exhibit is a large number of models, maps, and plans of the principal canals, breakwaters and dikes, which have enabled this energetic little people, not only to successfully repel the encroachments of their terrible enemy, the sea, ever ready to swallow them up at the first sign of weakness on their part, but even to tame the monster and turn him from a dreadful into a useful power. The dikes exhibited are founded on timbers and piles filled with stones and riveted with gabions of rushes, willows, &c. Dutch shipbuilding is extensively represented by well-executed models of ships, showing that the once powerful Queen of the Seas has not entirely forgotten the art which Peter the Great tried to learn from her. Most of these models represent fishing vessels and merchantmen.

The machine works and shipbuilding yards of the Dutch Steam Navigation Company, of Fyenoord (Rotterdam) have sent the complete drawings of a high-pressure marine engine of 2700 indicated horse power. This engine was designed for a frigate of the Royal Dutch Navy. The drawings representing cross-sections of the hull are on a scale of 1-5, and that in which the transverse section is shown is on a scale of 1-25. We give below the principal dimensions of the engine and boilers:

ENGINE.	
Diameter of piston.....	m. 1.85
Travel of piston.....	m. 0.65
Number of revolutions per minute.....	90
Variable cut-off, from 1-10 to 5-10 stroke.....	
Diameter of air pump.....	m. 0.445
Travel of air pump piston.....	m. 0.65
Two condensers with..... tubes 876	
Internal diameter of tubes.....	mm. 23
Length of tubes.....	m. 1.6
Condensing surface.....	sq. m. 725
Diameter of screw.....	m. 4.85
Pitch of screw.....	m. 5.79
BOILERS.	
Number of boilers.....	4
Diameter of boilers.....	m. 5.68
Length of boilers.....	m. 5.4
Number of furnaces.....	24
Diameter of hearth.....	m. 0.974
Length of hearth.....	m. 1.823
Graze surface.....	sq. m. 40
Number of tubes.....	4,720
Internal diameter of tubes.....	mm. 70.6
Length of tubes.....	m. 2.045
Heating surface.....	sq. m. 1,000
Steam pressure.....	atmospheres 4½

The Royal Machine Works of Amsterdam have an apparatus for the concentration of cane juice, with three boilers and horizontal engine, and a large model (scale, 1-20) of an iron floating dock 100 meters long, 27 meters wide and 12.50 meters deep. The total displacement of this dock when loaded is 8532 cubic meters; the unloaded displacement is 3185 cubic meters, and the unloaded draft is 1.52 meters. A small rotary engine is exhibited by W. H. Jacobs, of Haarlem, and H. J. Koopman displays some injectors. Stork Bros. & Co., of Hengelo, have sent four steam engines—one 20-horse-power engine with patent valve gear and variable cut-off depending on the action of the governor, one small horizontal engine, one semi-portable engine with vertical boiler entirely separated from the engine, both being fixed to a bed plate, and one portable engine. These are representatives of the four types of engines manufactured by this company. They also manufacture wood-working machinery, boilers, hydraulic presses, &c., but they have not exhibited any of these.

"Necessity is the mother of invention," says the wisdom of nations. We have seen above how necessity has developed that branch of civil engineering in Holland which consists in fighting water. When we saw what primitive methods of fighting fire are employed in the Low Countries, ay, and throughout the whole Continent for that matter, our first impulse was to smile. But on second thoughts it occurred to us that if in the United States we have perfected the cure of the evil, they in Europe have found the prevention. Their buildings are almost fire-proof. They have no need of a perfect system for mastering fires. They really do not know what a fire is. The ounce of prevention enabled Paris, with no adequate resources against fire, to go through a long siege and the commune with comparatively very little loss by fire; indeed in many cases it was found necessary to cover the buildings with petroleum before they would burn. What has our pound of cure availed in the great Boston and Chicago fires? To return to our subject, we find two exhibits of fire engines in the Dutch machine gallery. A. H. van Bergen, of Helligerlee, has one and A. Bikker & Son, of Rotterdam, the other. The latter claim that with their engine 12 firemen can pump 215 liters of water per minute to a height of 30 meters, through a hose 16 meters long, with a nozzle 14 mm. in diameter.

In the exhibit made by the Dutch East Indies we find models of mines, samples of natural and artificial coal, iron and tin ores, tools and models of apparatus employed in searching for and in cutting diamonds. Datoc Candocka Liang So, sub-chief of the district of Tjandoeng (Padang), exhibits two models of water wheels for raising water. A model of the suspension bridge over the Batang-Toro is exhibited. It is constructed on telegraph wire stretched across the river. Another suspension bridge, that over the Progo River at Magelang, is constructed entirely of bamboo. Specimens of the agricultural instruments employed in Java, Sumatra and some of the other islands composing the Dutch East Indies are also shown. A pyramid composed of 400 ingots of tin represents the mean daily production for the

last 45 years in Batavia, and a smaller pyramid represents the millionth part of all the tin produced in the same time in the island of Banka. J. A. G. Vosmaer of this island has sent a model of the furnace employed by the Chinese for the reduction of tin ore.

PORTUGAL.

The mineral wealth of Portugal was well known to the ancients, who left numerous traces showing that they had worked the mines. But for a long time the mining industry was entirely neglected, and its progress can only be said to date from very recent times. All the provinces of the kingdom are rich in iron ores. Magnetic ore is the widest spread, but in some provinces there are important beds of specular iron ore, hematite and carbonates. Lead and copper abound in certain districts, and tin, zinc, manganese and antimony are found in various portions of the country. There are also a few nickel, cobalt and silver mines. There are very few coal beds in Portugal, and peat does not abound.

In the Portuguese section of the machine gallery there is not a great deal of interest to us. In fact, we find here almost everything—except machinery. The Portuguese mines have sent specimens of their ores. We find iron ores, principally magnetic ore and hematites, a large quantity of copper pyrites, nickel, cobalt, zinc, lead and some antimony and manganese, the latter in the form of pyrolusite. Besides these there are some safes exhibited by Valentim Ferreira, of Porto, and João Thomaz, of Gaya (Porto); a few displays of nails and shot; a 2-horse-power engine, and a machine for cutting tooth-picks sent by Sousa Cruz & Sons; and a solitary horse car, or "American tramway" as it is called. This last comes from the works of the Porto Tramway Company.

Metallurgical Notes.

REFINING BASE BULLION.

An interesting point has been raised by the *Engineering and Mining Journal* in regard to the refining of argentiferous lead, the so-called base bullion. It is stated in an article pointing to the difficulties which will beset the practical working of Keith's electro-metallurgical process (noticed in a recent issue of *The Iron Age*) for the desilverization of lead, that calcination of impure bullion in a reverberatory furnace would eliminate perhaps four-fifths of the deleterious substances, but that the final residuum would still contain two parts of antimony, &c., for one of silver. This statement is misleading, as it is possible, by refining bullion in a reverberatory furnace, or even by steaming in a kettle at a red heat, to reduce the amount of antimony and arsenic to a trace, so that the characteristic surface indentations of antimonial lead disappear entirely and the molten lead is covered by a uniform film of an oxide of lead showing the purity of the metal. A case in point is cited in Plattner-Richter's work, of Freiberg slag lead holding 5.54 per cent. of antimony and 1.64 per cent. of arsenic being refined in 19 hours in a reverberatory furnace, the resulting lead containing only 0.06 per cent. of antimony and 0.05 per cent. of arsenic. If perfect refining were not attainable it would be impossible to make market lead from the impure bullion which every refiner of Utah brands has too often occasion to treat besides the metal obtained by working his own intermediate products, because the only method now used is calcination. It is a fact well known to zinc desilverizers that desilverization proper does not decrease the percentage of antimony and arsenic. The following figures from Kerl's *Metallurgy* will substantiate this: Antimony after first addition of zinc, 0.034 per cent.; after second addition, 0.043; after third addition, 0.046. The subsequent refining of the poor lead for the removal of zinc will show, after that impurity has been carried off, that when the first calcination was properly conducted the metal obtained is directly marketable, free from antimony or arsenic. By refining the base bullion it will, therefore, be possible to obtain by Mr. Keith's process silver residuum holding very little antimony, but always some copper. Experience alone can prove whether it will be better to refine first, suffering the losses and expense of that operation and of the processes for utilizing the products thereof, or whether gold and silver can be separated by an electro-metallurgical process, by fusion with lead and cupellation, or by melting with refining materials, such as nitrate of soda and borax (with the additional object of obtaining saleable antimony and arsenic). It is certain, however, that the alternative of using the first method of previous calcination in order to evade the difficulties of a dirty final product, is open to those who employ the process.

RECENT IMPROVEMENTS OF THE STETEFELDT FURNACE.

Stetefeldt has recently published in the *Mining and Scientific Press* a description of some alterations in his well-known furnace for roasting refractory silver ores. These consist in slight but important changes in the charging and discharging apparatus. The latter is now effected by making the bottom of the furnace a movable iron damper which rests on brackets with friction rollers. By simply withdrawing this the ore is discharged into a car standing upon a railway beneath. The feeding machine consists of a cast-iron frame, which is placed on top of the shaft, and is provided with a damper, which is drawn when the furnace is in operation, but is closed when, for any cause, the furnace stops for any length of time, or when the screens have to be replaced. This frame contains a cast-iron grate, to the top of which a punched screen is fastened. This latter is made of Russian sheet iron or of cast-steel plate, with holes one-tenth to one-eighth inch in diameter. Above the punched screen is placed a frame to the bottom of which is fastened a coarse wire screen, generally No. 3, made of extra heavy iron wire. This latter frame rests upon friction rollers. The brackets which hold these friction rollers can be raised or lowered by set screws, so that the wire screen may be brought most to or removed away from the punched screen, as may be desired. By means of a shaft with eccentric the wire screen can be put into a sharp oscillating motion. Above this screen and fastened to movable brackets,

extend arms which come nearly in contact with the wire screen. The distance from it can be adjusted by set screws. By means of conical pulleys the wire screen can be put in motion at the rate of 20 to 60 strokes per minute, just as may be desired. By this means the amount of ore discharged into the furnace may be exactly regulated. This can also be done to some extent by varying the distance between the two screens and that between the wire screens and the blades. The effect of these blades is to keep the pulp in position when the screen is oscillated and to act as distributors of the pulp over the whole surface of the screen. Above the screens is placed the ore hopper. The hopper receives the ore from an elevator which receives its supply from another hopper, into which the fine ore is discharged by the crushing machinery. The ore is generally pulverized through a No. 40 screen. It will be seen that this arrangement enables the charging to be done without any large and heavy building upon the top of the furnace, while the fireman standing below can have perfect control of the feeding machinery.

IMPROVING CAST STEEL.

Ossann publishes in the *Berichte d. Deutsch. Chem. Gesellschaft* the description of a method which he claims will improve the quality of cast steel. As its quality deteriorates under the action of an oxidizing flame, generator gases are partly or entirely replaced by gas obtained by the dry distillation of coal, petroleum, &c. This gas is then deprived of carbonic acid and steam either by condensation or passing over incandescent fuel.

THE PONSARD CONVERTING FURNACE.

The Ponsard Converting Furnace (called "Forno-Convertisseur-Ponsard" by the inventor to distinguish it from "Four Ponsard"), has a movable inclined hearth. One side of the furnace is provided with tuyeres which, according to the position of the hearth, dip into the metal or are above it. When the hearth is so placed that the tuyeres blow through the metal, the latter is decarburized in the same manner as in the Bessemer process. As soon as the metal is thought to be nearly finished the hearth is given half a turn, by which means the tuyeres come out of the bath and the blast is stopped. This permits careful sampling, as the metal is continually under the action of a temperature beyond the melting point of steel. The inventor claims the following advantages: Pig iron in silicon and carbon may be used; before blowing, scrap iron amounting to two-thirds of the charge may be added, and the metal may be made as soft as desired. Further claims made are low cost of plant and low consumption of fuel. The following figures, obtained at the works of Messrs. Blondiaux & Co., of Thyle-Château, may serve as a means for judging some of the points involved:

No.	Charged cold—Metric tons.	Time, hours.	Coal, M. tons.	Waste, per ct.
1	2.0 pig..... 3.0 old steel rails.....	4-45	1-085	10.75
2	2.0 pig..... 3.0 old steel rails.....	4-30	1-015	10.75
3	1.5 pig..... 0.5 steel rails..... 2.0 Bl'd'x wt' iron.....	4-00	0-730	10.75
4	1.5 pig..... 1.0 steel rails..... 2.0 Bl'd'x wt' iron.....	4-00	0-730	12.00
5	2.0 pig..... 4.0 steel scrap.....	4-00	0-750	11.70
6	2.0 pig..... 4.0 steel scrap.....	4-50	0-720	11.00
7	2.0 pig..... 2.0 steel scrap..... 2.0 Bl'd'x wt' iron.....	4-15	0-750	12.00

The duration of the blowing varies from 30 to 45 minutes, the pressure being 8.4 inches of mercury. A furnace working 8 tons per charge would call for a blowing engine of 30-horse-power, capable of furnishing blast of 18-inch pressure. In the cases given the pig was charged cold, as was also a part of the steel scrap when used, the rest being previously heated. The tuyeres outlast three operations.

PELLET'S ROASTING FURNACE FOR PYRITES.

One of the main principles which should guide constructors in the building of roasting furnaces for desulphurizing ores containing sulphur is to move the ore in a direction opposite to the course taken by the hot gases. The ore richest in sulphur will then burn slowly in a cooler atmosphere containing a large amount of sulphurous acid, while the ore almost finished, low in sulphur, obtains the intensely heated and highly oxidizing gas required for its complete desulphurization. Pellet's furnace complies with these requirements. It consists of a series of hearths made of tile, so arranged that the charge can be dropped from the uppermost to the one below through an opening. It is then pushed backward on the second hearth till it falls through an opening at the off end of this hearth upon the back part of the third, on which it is drawn forward. A grate is provided at the back end to heat the furnace, and openings at the front end permit the handling of the ore. It will be seen that this furnace is a simplified construction of the elder large three-hearth furnaces, which have been of late generally abandoned on account of the frequency and the cost of their repairs.

SWEDISH REHEATING FURNACE.

With a view to preventing the distillation which always takes place when fresh bodies of bituminous coal are charged upon the grate, and, consequently, of economizing fuel, a peculiar construction has been adopted in Sweden. The fuel is charged into an open funnel piercing the arch above the grate; around the lower end of this funnel is a second one open at the bottom, through which blast passes into the furnace, where it meets the gases produced by the slow combustion caused by draft on the main grate. The intimate mixture of the two yields complete combustion and intense heat, which is rendered more uniform for the entire surface of the hearth by the fact that there is a grate at each end of the furnace.

SEPARATION OF SULPHUR FROM ITS ORES IN SICILY.

A correspondent of the *Mining Journal* gives the following description of the mode of melting sulphur from its ores as it is at present practiced in Sicily, the great sulphur producing country of the world. As

* Will the English please fire first.

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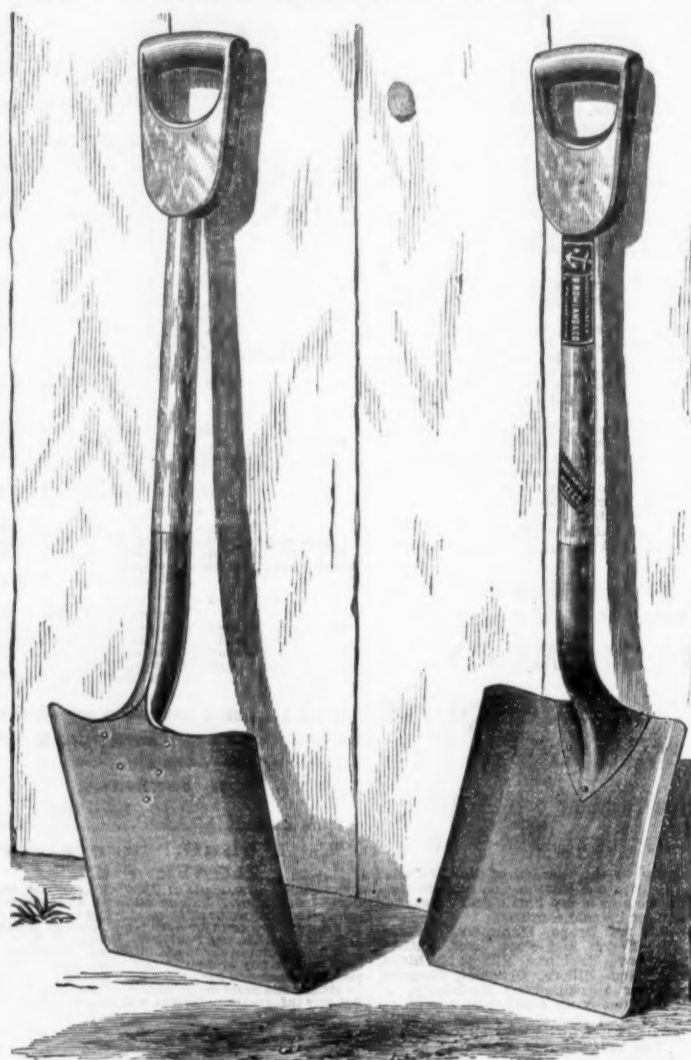
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NEW ENGLAND AGENTS.

it is exceedingly simple and cheap, although very wasteful, it may prove valuable for the utilization of the immense deposits of sulphur known to exist in Utah and other parts of the Rocky Mountains. The ore is fired in "calcheroni," or large open kilns, in which it is heaped, a portion of the sulphur contained in the ore being burnt to produce the heat necessary to melt out the remainder. A "calcheroni," or kiln, consists merely in a semicircular wall inclosing one-half of the circular floor, which is formed of finely sifted "ginesi," or spent ore, firmly rammed; this floor is made with an inclination of about 1 in 4 or 5. The walls are built of coarse rubble stone, set in plaster made from the gypsum, which is one of the accompanying rocks of the sulphur formation; in some cases even the spent ore itself makes an excellent building material. In the middle of the wall, corresponding to the lowest part of the floor, a rectangular opening 4 or 5 ft. in height and 1 ft. in width, called "la morte," is left. In loading a calcheroni a number of large stones are heaped up at the "morte" so as to leave a covered passage 4 or 5 ft. in length toward the center of the kiln; this is called "le porte," and serves as a space for the melted sulphur to collect before being run off. The rectangular opening, or "morte," is then closed with a kiln wall, and the loading of the calcheroni begins—first, by placing the larger lumps of ore on the floor in such a manner as to leave a free passage for the melted sulphur toward the "morte," and on this the ore is heaped, care being taken to place the larger lumps in the middle and bottom and the smaller toward the top and outside; in this manner the flow of the sulphur as it melts is not intercepted, as would be the case were no care taken in the loading and the large and small pieces indiscriminately thrown in together. The conical top is covered with fine "ginesi," or spent ore, from former fusions, with the exception of a rectangular space at the back or opposite side to the "morte," and the ore is fired by placing on it a few bundles of dried weeds or straw that has been previously dipped in melted sulphur. After five or six hours, or even more, according to the state of the ore, whether wet or dry, the season of the year, quality of ore, &c., so as to give the heap time to be well alight, this space is covered with "ginesi," and the calcheroni is left to itself, and requires only occasional attention to prevent any places burning too rapidly and the fire spreading unequally toward the front. The thickness of the covering varies from 2 or 3 inches to as much as 10 inches, according to the quality of the ore in fusion, the weather, &c. After eight or ten days the melted sulphur commences to flow to the "morte," and finding it relatively cold it becomes solid, forming the so-called "intavolatura;" this it is necessary to remelt, and for this purpose a hole is made in the thin wall which closes the "morte," and small bunches of straw dipped in melted sulphur are lighted and introduced. In this manner the vacant space becomes heated sufficiently, and the melted sulphur flows readily from the hole into wooden molds, called "gavite," and on solidifying form cakes, or "batate," of sulphur weighing about 121 lbs. each. Care has to be taken to prevent the internal heat of the calcheroni becoming too low. The duration of a fusion depends upon the quality of the ore, and in a great measure upon the size of the calcheroni, but no rule can be laid down. However, generally speaking, a calcheroni containing from 500 to 700 tons of ore requires thirty days from the time it is lighted to that when the last sulphur is run off, and another thirty days before it has cooled down sufficiently to be unloaded. The chief merits of this process are its extreme simplicity and the large quantity of ore that can be treated at once; but at the same time it must be borne in mind that it is extremely wasteful, as a large quantity of sulphur must be burnt to furnish the heat necessary to melt the remainder, and I believe that I am not exaggerating in stating that at least one-half of the sulphur contained in the ore is lost.

PRODUCTION OF THE CALUMET AND HECLA.

The Boston correspondent of the *Mining Gazette* gives the following figures as the product of the famous Calumet and Hecla copper mine of Lake Superior. The mineral shipped to the smelting works in the years 1874-'75, 1875-'76, 1876-'77 and 1877-'78 was 13,229, 14,073, 14,135, 15,528 tons of 2000 pounds respectively. As this mineral held 78.30, 77.46, 76.43 and 76.16 per cent. of copper, the corresponding amounts of ingot produced were 10,352, 10,901, 10,802 and 11,823 tons.

A NEW MERCURY ASSAY.

Prof. F. W. Clarke, of the University of Cincinnati, has extended the electrolytic method of estimation, so successfully introduced of late years for assaying copper, to mercury also. A solution of mercuric chloride, slightly acidulated with sulphuric acid, was placed in a platinum dish connected with the zinc pole of a 6-cell Bunsen's bichromate battery. The wire from the carbon pole terminated in a thin slip of platinum foil, which dipped into the solution. At first mercurous chloride was precipitated, but this by degrees was reduced to the metallic state, so that after an hour or so there remained in the dish a clean mass of mercury, covered by a solution in which ammonia failed to produce the slightest turbidity. When this clear acid solution was poured off the mercury became covered with a thin tarnished film. This annoyance could be avoided very easily by removing the liquor with a pipette and replacing it repeatedly by clean water, care being taken not to disconnect the platinum dish from the mercury.

METALLURGICAL TREATMENT OF TELLURIDE ORES.

In view of the great interest which attaches to the treatment of telluride ores, so abundantly found in Colorado, the following summary of the method practiced in 1872 at the famous Hungarian locality, Nagyag, as published by Schreoter, will be found worthy of consideration: The ores are first warmed with dilute and then with concentrated hydrochloric acid, until the formation of sulphuretted hydrogen has ceased. The clear solution is decanted and the residue, containing telluride of gold and of silver, is carefully washed and afterward boiled with aqua

regia. The gold thus brought into solution is precipitated with sulphate of iron and the tellurium is deposited with zinc. The chloride of silver in the residue is decomposed by hydrochloric acid and zinc. As the metallic silver thus obtained is very impure, it is redissolved in sulphuric acid and reprecipitated with copper. In order to prevent the impurities of the zinc from mixing with the chloride of silver when it is being decomposed, the zinc is wrapped in cloth, a silver wire is attached to it, which is then conducted into the chloride of silver. As the above description of the process will suggest to every metallurgist, it is, in its present state, adapted only to rich ores. So far as present indications go, the best mode of utilizing low grade ores is to concentrate them and treat them by some process for which the above may furnish a suggestion. Local circumstances must decide how far losses in concentration counterbalance diminished cost of treating smaller quantities, and at what point the limit of economy is reached.

PRODUCTION OF IRON ORES IN SWEDEN IN 1876.

Prof. Rich. Akerman, the well-known Swedish metallurgist, gives the following figures for the production of the iron ore mines of the various government districts of Sweden in 1876 in metric tons:

Norrbotten.....	48
Vesternorrland.....	494
Jemtland.....	102
Gefleborg.....	24,802
Upsal.....	35,710
Stockholm.....	26,248
Kopparberg.....	191,654
Vestmanland.....	147,219
Orebro.....	301,770
Vernland.....	110,031
Boedermanland.....	14,997
Ostergotland.....	7,609
Jonkoepping.....	7,904
Total.....	787,048

The total amount of lake and bog ores mined in Smaeland reached only 9007 tons.

MINING ITEMS.

COAL.

The coal works at Leechburg, Pa., are running five days in the week.

Four hundred tons of English gas coal were brought to Philadelphia in ballast recently, and sold by Messrs. Campbell, Tucker & Co., of Walnut street. This is only one of several other cargoes of similar coal that has been sold in Philadelphia this year.

Report of coal sent over the Shamokin Division of N. C. R. W., for the week ending Sept. 14, 1878:

East.....	T. C.
West.....	14,372 03
Same time last year.....	25,896 12
Decrease.....	11,524 09
Total amount shipped to date.....	380,551 02
Same time last year.....	450,017 17
Decrease.....	69,466 15

The cost of fuel is now low on several American railroads, but there are certainly very few which can get coal as cheaply as many in England can. In his speech at the late half-yearly meeting, Mr. Ellis, chairman of the Midland Company, one of the greatest in England, said that the price had now got down to an average of about six shillings per ton, which is about \$1.46 for 2240 pounds. In 1873 the average cost on this same road was just three times as much.

About 42,000,000 bushels of coal are required to manufacture the 63,000,000 bushels of coke produced in the Connellsville district. The coal is of an unusual quality, and is stored in the earth in an unusual manner. It is in thick veins, unusually soft, and is mined for three-quarters of a cent per bushel, with which pay miners are satisfied, owing to these advantages, and also to the measurement of all the gobbing into the bushels for which they are paid, there being nothing screened out.

Thus far the amount of coal shipped to lower ports on the recent rise in the Ohio River from Pittsburgh aggregate 6,333,000 bushels, which will be distributed as follows: Wheeling, 166,000 bushels; Cincinnati, 3,037,000 bushels; Madison, 205,000 bushels; Louisville, 2,819,000 bushels; St. Louis, 112,000 bushels. Of this amount at least 80,000 bushels of coal and 25,000 bushels of coke were sunk at the Beaver bridge.

The Anthracite Board of Control held their regular monthly meeting September 17, and after mature deliberation as to the condition of the market and its probable requirements for the future, determined to make the allotment for October 1,200,000 tons. This would give to each interest the amount named below:

	Per cent.	Tons.
Reading.....	28.625	343,500
Lehigh Valley.....	19.750	236,000
Central Railroad.....	12.293	147,500
Del., Lack. and Western.....	12.750	153,000
Delaware and Hudson.....	12.480	149,760
Pennsylvania Railroad.....	7.625	91,500
Pennsylvania Coal Co.....	5.865	70,380

The business in the years 1873-7 during October has ranged as follows:

	Tons.
1873.....	2,132,129
1874.....	2,414,734
1875.....	2,396,687
1876.....	2,460,846
1877.....	2,159,749

The tonnage to September 7, from Pictou, N. S., is some 87,771 tons, divided as below:

Halifax.....	31,801
Acadia Company.....	23,300
Intercolonial Company.....	18,374
Vale Company.....	10,413
Nova Scotia Company.....	3,793

We have the following notes concerning the coal mines of the lower oil regions of the A. V. R. R.: The Mahoning Coal Company is lying idle. The Pittsburgh Coal and Mining Company, Mr. L. Singley, superintendent, who have their works at Catfish and Lowerhillville, have a capacity of 300 tons per day; average shipments, 225 tons per diem. They have a standing contract of 10 cars a day with the Grand Trunk Railroad of Canada. The Reimerton Coal Company has not yet resumed operations. The Mineral Ridge Company at Monterey station have been working constantly for five years. Their average shipments are 200 tons per day. All their coal goes to New York, principally to the New York Central and Hudson River Railroad. McCollum mine at Monterey is now running only one or two cars a day. The Sligo Coal Company is doing very little. The Monongahela River coal miners have

fixed upon two and one-half cents as the wages for digging coal, subject to the decision of a miners' convention to be held at Wiley's Grove, near Elizabeth, at an early day. Meantime miners are forbidden to work for less than the price agreed upon. The operators claim that the Southern demand for coal is so light and the prices so low that they cannot afford to pay the price demanded. In this view a suspension of work for a time is probable.

The coal mines at Church Hill, Ohio, are all in successful operation, and are shipping 400 tons of coal per day.

IRON.

The Wheatfield ore banks, in Spring township, Pa., near Fritztown, operated by Messrs. Eckert & Bro., of the Henry Clay furnaces, this city, are at present worked day and night, excepting Saturday and Sunday nights. Two engines are being erected at present at the mines for the purpose of pumping water out of the slopes.

COPPER.

The management of the Osceola mine, Lake Superior, says the *Mining Gazette*, has concluded not to attempt to draw on the "pay ore" stretch of conglomerate to supply the stamp mill until the lately burned down rock and shaft houses are rebuilt. The work of pumping out the No. 3, or so-called southern shaft, preparatory to sinking it several "lifts," has already commenced. Developments on the amygdaloid, by means of shaft and level, continue. Spots in the lode that have been broken into show some excellent copper ground, and tend to encourage lively hopes for the future of this part of the mining property.

During the week ending April 6, 67,187 pounds of pig copper was received at Silver City, New Mexico, mostly from Arizona.

PRECIOUS METALS.

The silver mines of Georgetown are turning out large quantities of the richest ore. The correspondent of the *Silver City Herald* at that place writes: Messrs. Bettler & Kennedy have a breast 10 feet wide by 3 feet high of splendid ore. They have out about a dozen tons of good ore ready for the mill, and will soon have out as many more. The McNulty mine has been turning out some magnificent ore during the past few days. Stevens & Walters have been taking out some better ore than ever, which will exceed \$2000 per ton.

Speculative Building.

From a paper read before the Public Health Association of New York by Mr. Charles F. Wingate, we take the following, which will commend itself to all plumbers: Sewer gas is not a new thing. Years ago it was analyzed, and its constituents and action are fully detailed in medical and sanitary publications. But why it should suddenly develop as it has lately done, with its attendant train of disease, and why it should most affect the houses of the well-to-do rather than those of the very poor, is a problem not yet explained. It is well known that foul air and defective drainage create disease in the slums of all great cities. The so-called modern improvements, so conducive to cleanliness and therefore, it would seem, to health, have apparently been the means of introducing malaria into our houses. Hence has arisen a widespread and growing distrust of such improvements, and the opinion is constantly expressed that it would be safer to dispense with plumbing altogether and return to the primitive simplicity of our forefathers in such matters. Because railway trains telescope and boilers explode, no one proposes to abolish steam, nor to cease eating because some foods are adulterated. The wholesale denunciations of our present system of drainage is no less unwarrantable and illogical.

Where, then, does the blame rest? Plumbers, like mothers-in-law, have received more than their fair share of ridicule and odium, and it is time justice should be done them. The real culprit who is primarily responsible for the presence of sewer gas in so many modern dwellings is the "speculative" or, as he is called in England, the "Jerry" builder. By the term "speculative builders" is not meant capitalists who build houses on speculation, and who, having a reputation to sustain, build durably and well. The former class are wholly irresponsible. Lacking technical training, and having little (if any) education, their knowledge is confined to a mastery of the methods of how to humbug the public. They are not bad-looking houses as a rule, but, being built to attract the eye, the greatest attention is paid to appearances. Usually they are mere shells, hastily run up, and of cheap, unseasoned materials. The walls soon sink and crack. The plaster flakes off; the woodwork warps, doors sag, sashes stick, roofs leak, chimneys choke, and general deterioration follows. Within a year repairs are necessary, and once begun they soon become chronic. Yet no amount of outlay will result in more than a mere patch-work, and the whole structure may be summed up in the apt trade phrase, "cheap and diphtheria." The building and fire department regulations are skillfully evaded, while as we have not yet reached the point of enforcing a proper standard of workmanship and material in plumbing, the latter is neglected in the most criminal manner. Soil pipes will be left without any sewer connection, or they may be fairly honeycombed with holes from flaws in casting; light-weight traps will be used; joints made with putty instead of lead or cement, and proper ventilation and traps will be conspicuously lacking. Yet such of the plumbing fixtures as are not hidden beneath floors and in dark corners may be handsome, if not elegant, with marble-topped basins, silver-plated faucets, and other luxuries calculated to give the impression that everything is solid and complete.

The number of such dwellings in New York and its vicinity must be reckoned by thousands. The entire upper part of Manhattan Island above Thirty-fourth street is packed with the work of the speculative builder. In Boston, a late examination by the Board of Health of the sanitary condition of 345 specimen houses in all parts of the city showed that 198 had defective drains, 205 had soil pipes without ventilation, 110 had

damp or wet cellars and 275 were without effective traps. In Brooklyn, out of 37 houses in which contagious diseases occurred a short time since, 33 had defective plumbing. Indeed, it is safe to say that two-thirds of the new dwellings in all our leading cities have been built "on speculation."

A builder contracts with a capitalist to purchase through the latter one or more city lots at a fixed profit of from 25 to 100 per cent., on which he agrees to build provided the capitalist advances one-half the cost of the improvement as a loan. The lot value, profit and loan, are all secured by mortgage. The builder immediately "conveys" a goodly portion of the loan to his private use, and supplies the deficiency by issuing notes. He contracts with masons and other mechanics to supply materials and begin the work of building. As the original loan is sufficient to pay the cost of construction, these sub-contractors feel secure of pay, and eagerly bid for the work. First payments and some wages are needed to start the enterprise, but soon the set purpose of the builder is evident—to pay out as little money as possible. Notes are substituted for cash, and are renewed and extended indefinitely. The sub-contractors being obliged to complete their work before they are entitled to the benefit of the lien law, gives the builder almost despotic control over them. They are fortunate if the buildings are completed at all. Often a deadlock ensues, and the capitalist is induced to discount future payments by plausible pleas or a fat bonus. If the building is finished it is placed on the market, and by dexterous management sold "on easy terms." In that case the builder is in pocket and begins a new speculation of the same kind. But if the building fails to meet with a ready sale, the capitalist forecloses the mortgage in default of interest payments, or for some other cause, and appropriates the property himself. This leaves the builder with a fair stock of money from the unexpended portion of the loan, while the sub-contractors and mechanics are compelled to whistle for their dues, having been cut out of their liens by the priority of the capitalist's claim.

But the palmy days of the speculative builder are past. Savings banks and trust companies no longer proffer him loans. His credit, like his occupation, is gone. Meantime the public is becoming alive to the need of greater care in selecting dwellings, and is less disposed to take things for granted in sanitary matters. What is still wanting, though vitally necessary, is a system of competent inspection of dwelling houses, and the enforcement of requirements for the protection of health similar to those for security against fire and accidents. When this is accomplished a new era will have dawned, and a very sensible check will be imposed upon the mortality of the metropolis.

Relief for the South.

122 Chambers Street,
NEW YORK, September 25, 1878.
To the Editor of *The Iron Age*: The following is copy of letter received from the Howard Association, New Orleans, La., acknowledging \$75 from the operations of the Northampton Cutlery Co. Notice of this in your columns may induce operatives of other factories to respond to the call for aid to the suffering South.

Yours truly,
THEODORE WEED.
Office of HOWARD ASSOCIATION,
53 Camp Street,
NEW ORLEANS, La., September 15, 1878.
NORTHAMPTON CUTLERY CO.—Gentlemen: Your favor of the 11th inst. has been received and noted. Therein we found draft on New York for \$75 seventy-five dollars, subscription for the aid of the yellow fever sufferers by the operatives of your Company.

You may be assured it will be well applied, and that it will prove very acceptable. We are truly grateful for this generous donation, and please do us the favor to convey them our sincere thanks for their kindness, which will always be remembered by us. Very respectfully, your obedient servant,
F. N. OGDEN, Vice-Prest.

A French Industrial Association.—A number of French manufacturers, including representative men such as Schneider, Puyet, Quartier, Dupont, Moreau, Cail, Farcot, Petit, Fould, Bosquet and others, have formed an association to protect themselves against any tariff legislation injurious to the interests of industrial enterprise and manufactures. They have organized under the title of Association de l'Industrie Française, and have chosen as their president M. Julien, a director of the Terre Noire Steel and Iron Works.

Special Notices.

STEEL.

Manufacturers of medium and low grades of Bar and Sheet desiring our Eastern agency are invited to address
A. Box 2685, P. O., Boston, Mass.

Established trade.

Situation Wanted
as bookkeeper or assistant to same in a wholesale and jobbing Hardware House, by an experienced young man well acquainted with the trade.

Best reference given.
Address
Office of *The Iron Age*, 53 Reade St., N. Y.

BISSELL & WELLES,
Auctioneers.

Special and Peremptory Sale of 500 kegs Flat and Round Head Rivets, assorted lengths and sizes, on Tuesday, Oct. 8th, at 10½ a. m., at our salesroom, No. 123 Chambers and 55 Reade Sts., New York. The goods to be sold at this sale are standard goods, in good order and good size, and assorted Flat and Round Head, Bevel, Cone, Countersunk and Steeple Head Shovel and Hame Rivets, Coach Screws, &c. The entire quantity will be sold without reserve and in quantities to suit the small and large trade.

Scrap for Sale.

About three tons extra selected heavy Norway Iron Scrap—all pure imported Norway.
About one ton common heavy Iron Scrap.
About one-half ton extra Tool and Machinery Steel Scrap.
F. A. HULL, Danbury, Conn.

Special Notices.

PATENT RIGHTS FOR SALE.

Mannebach Nitro Planing Machine. Also, Mannebach Box Dressing Machine, patented June 25th, 1878, calculated to clean 5000 boxes per day. Machines can be seen at the inventor's.
J. MANNEBACH,
151 Essex St., New York.

FOR SALE.—ONE DOUBLE-HEADED LATHE, specially built for turning off the ends of iron columns 3 ft. in diameter, one head geared, one head shifting. Swings 3 ft., shears measure 30 ft. long by 4 in. wide. In prime order, and is a first-class tool. Lathe used in Jackson's Excelsior Iron Works. Price, \$200.
One single-head LATHE. Works with a round leather belt. Swings 4 ft.; total length, 30 ft. Out of the Albair Works. In good order. Price, \$50.
One No. 1 Sturtevant Blower for forges. New. Complete. Two (of the eight) arms accidentally broken, but does not affect its working. Price, \$20.
Five iron SUSPENSION DRILLERS, with drill tables and all complete. Price, \$20 each.
One pattern-makers' Jig Saw, iron frame table. Price, \$12.
WM. J. FRYER, JR.,
Atina Iron Works, 104 Goerck St., N. Y.

SEPTEMBER LIST, No. 2.

MACHINE TOOLS, Second-Hand.
Two Woodruff Steam Engines, automatic cut-off, cylinder, 20 inch diameter, 48 inch stroke.
One Portable Engine, 7 in. cylinder.
One No. 3 Stiles Geared Press.
One No. 2 Fowler Press.
One Sellers 500 lb. Steam Hammer.
One Hand Milling Machine.
Three Chain Patent Pipe Cutting Machines.
One Engine Lathe, 16 in. swing, 8 ft. bed.
One Back Geared and Self-Feed Drill, 32 in. swing.
One Pattern Makers' Lathe, 22 in. swing, 8 ft. bed, iron shears overhanging face plate and tripod rest.
Two Engine Lathes, 13 in. swing, 6 ft. bed.
One Engine Lathe, 22 in. swing, 8 ft. bed.
One Engine Lathe, 26 in. swing, 36 ft. bed.
One Engine Lathe, 15 in. swing, 6 ft. bed.
One Engine Lathe, 15 in. swing, 7 ft. bed.
Three Engine Lathes, 20 in. swing, 8 ft. bed.
Six Turning Lathes, 14 in. swing, 4½ ft. bed. Three 4-spindle Drills.
One 32x36 ft. Planer. One 48x48x12 ft. Planer.
One 8 in. Shaper. One Gear Cutter. One new "Hardway" Table Machine, to be sold at 2½ in. bolts. One new "Hardway" Bolt Head Machine to be sold at 1½ in. bolts. A lot of Saw Tables and Wood Working Machinery.
Please specify which of the above tools you want and we will forward all particulars.
The above tools will be sold very low, and can be seen at

The George Place Machinery Agency,
121 Chambers and 103 Reade Sts., N. Y.

MACHINERY.
Machine & Forging Shop Equipment
FOR SALE.

All the Machinery & Tools, Patterns & Drawings, Merchandise, &c., &c., lately belonging to the estates of the Hull & Bevel Co., of Danbury, Conn., and Stevens, Holley & Co., are now in my hands and for sale at low prices to close up said estates.
Same consists of Drops, Hammers, Presses, Forges, Anvils, Bench and Foot Vises, Lathes, Planers, Drills, Screw Machines, Milling Machines, Gear Cutters, Hand Millers, Grinders, Shapers, Edgers, and other miscellaneous Machinery, together with full tool room equipment and an assorted stock of iron and steel, desirable sizes, shapes and qualities. Will be sold all together or separately. The established business of the Hull & Bevel Co., good will, &c., will be given into the hands of any party who will purchase enough of the outfit to carry on said business and keep same in Danbury. Said business can be shown to be a paying one if intelligently managed.
Visits solicited.
F. A. HULL, Danbury, Conn.

For Sale or to Rent:
RARE OPPORTUNITY!!

Richmond Architectural Iron Works, established for more than 25 years, embracing a centrally located lot of 12½ feet front on Cary street, running back on the line of Eleventh Street 120 feet to an alley 30 feet wide. The improvements consist of a machine shop, built of brick and covered with slate, 60x150 feet, of full stories, exclusive of cellar and attic. A brick foundry 40x60 feet, and brick offices and pattern shop, 30x60 feet.

In the foundry are two large cranes, No. 5 McKenzie Cupola and Sturtevant blower.
The machine shop embraces a complete outfit of valuable tools, as Machine Lathes, Drill Presses, Iron Planer, Bolt Cutter, Emery Machines, &c.
A collection of patterns of great variety, embracing almost every order of architecture. In fact every thing necessary to "start up" the works at once for a business of \$200,000 per annum.

The property will be sold at a great sacrifice from the original cost.
Purchaser can divide the machinery, patterns &c., from the real estate if he does not care to buy the latter. Proffers for a lease of the whole property; or for the machinery, patterns, &c., with such portion of the real estate as may be needed for the conduct of the business will be entertained. Apply in person or by letter to
WM. L. COWARDIE, Prest.,
No. 1015 Main St.,
Richmond, Va.

Wanted,
A responsible firm to take the Eastern Agency of our Anti-Friction Door Hangers.

Trade well established in the West.
Address
CLEVELAND HARDWARE CO.,
Cleveland, Ohio.

WANTED.—BY AN ENGLISHMAN (age 30) a situation as manager or assistant manager of engineering, iron or steel works. Has had good experience both in England and America. First-rate references. Is an Associate of the Institution of Civil Engineers. Address
F. J. JONES,
care of W. H. SMITHSON, Iron Merchant, &c.,
MIDDLEBROUGH-ON-TEES, ENGLAND.

A GENTLEMAN
with 12 years' experience with the New England Hardware Trade desires a position with some manufacturing company as traveling salesman. Trade already established. Address
HARDWARE,
P. O. Box 1051, Boston.

Wanted,
A foreman to take charge of a Malleable Iron Foundry. Must be a man of experience and one who understands thoroughly the business in all its details of manufacturing.

Address, stating past experience and giving reference.
Box 394 Milwaukee, Wis.

Special Notices.

JENNINGS'S COMBINATION DISCOUNT TABLES.
(Published by the author.)

OPINIONS.

37 Chambers St., New York, 1878.
We find them correct and wonderfully "labor-saving."
SARGENT & CO.

64 Chambers St., New York, 1878.
We find everything "O. K." and consider it of great use in our office work.
SPENCER & UNDERHILL.

MONTREAL, March 4th, 1878.
S. H. Jennings, Esq., Deep River, Conn.
DEAR SIR: The book of "Combination Discount Tables" was duly received by us as per our order. The writer has since its receipt given the Tables a variety of tests as to their practicability, accuracy and usefulness for the purposes indicated in the preface of the work. As the result of these tests, we have much pleasure in giving it our hearty commendation, and think it is a work that should be possessed by everyone having occasion in their business to check or arrive at the net results of combination discounts from invoices.

As a conservative of the mental forces employed in tedious calculations it is worth many times its cost. Yours respectfully,
MORLAND, WATSON & CO.,
Hardware and Metal Merchants, MONTREAL, CANADA.
Per WM. SKILL, Manager.

POUGHKEEPSIE, N. Y., February 23, 1878.
DEAR SIR:—Enclosed please find \$20 for which send up by mail one copy of "Jennings's Combination Discount Tables," as noticed in *The Iron Age* of this week. Trusting it is what we have wanted many times. Yours respectfully,
ELSWORTH & DUDLEY.

POUGHKEEPSIE, N. Y., April 5, 1878.
DEAR SIR:—Your "Discount Tables" came safely to hand, and the writer has tested it pretty thoroughly and very satisfactorily. Particularly so in getting cost on goods for MARKING them. Trusting you may find many who will express the same opinion, we are Yours respectfully,
ELSWORTH & DUDLEY.

NEW ALBANY, IND., April 23, 1878.
DEAR SIR:—Please let us know if we can procure "Jennings's Combination Discount Tables" in any city near here. We wish to examine it previous to purchasing. If you would like to send C. O. D. you paying charges, with privilege of examination before taking, you may send one. Yours truly,
JOHANN & CO.,
National Stove Works.

NEW ALBANY, IND., April 30, 1878.
DEAR SIR:—Your book received by mail. We like the Tables very much. Enclosed find three dollars. Please acknowledge receipt. Yours truly,
TERSTEGGE, JOHANN & CO.

NICHOLS, TIOGA CO., N. Y., May 9, 1878.
I am very much pleased with the Tables. They are a great saving of time and labor, and I take pleasure in recommending them to others.
ALEXANDER A. SWINTON.

ROCKFORD, ILL., May 20, 1878.
We use the Tables in making out invoices and find them accurate and useful, and would recommend them to parties who have many discounts to make and who wish to find the same quickly.
ROCKFORD BOLT WORKS.

It will be mailed, postpaid, to any address, on receipt of the price, \$3. Currency may be sent by mail at my risk. Address
S. H. JENNINGS,
Deep River, Conn.

To Manufacturers, &c.
FLOWER PINS.
Something new, made of light wire, for the use of florists and others. Patent allowed and offered for sale, either before or after issue. For specimen card of pins or further information address the inventor, J. H. FLOWER, 126 Pacific St., Brooklyn, N. Y.

N. B.—Specimen cards not intended for parties who only wish to buy or deal in the pins, which are not put into sale, and if they desire to obtain one must remit fifteen cents (stamps taken), but any information desired will be given free.

Wanted,
A ROLLING MILL FOREMAN.
He must be a good practical Heater, Roller and Roll Turner. None need apply without good references as to character. Address
H. H. S. W.,
Office of *The Iron Age*, 53 Reade St., N. Y.

Second-Hand Machinery
For Sale Low.
SEND FOR LIST.

Engine Lathe, built by Seth Wilmarth, 28 in. swing, 3 ft. bed, live spindle hollow, face plate both ends, one at front 6 ft. 4 in. diameter, one at rear 7 ft. 1½ in. diameter, two boring bars traversed by tail spindle, both arranged for spinning key ways; one of these bars is designed for work on rear face plate and has yoke to support other end of work; on either face plate work may be bored, turned and splined without removing the fastenings. At rear face plate an adjustable bed 11 feet long, carrying an adjustable tool rest, the latter having 4 ft. 6 in. traverse, arranged to sit at any angle and in any position on above bed. Tail spindle is 5½ in. square, carriage is fed by a screw the full length of bed, cross feed automatic, 6 grades of feed to operate either on grades of speed or live spindle, driving movement gears direct to front face plate, complete with counter-shaft for driving, spinning and feeding. One large saddle or center rest.

Planer, built by W. Collier & Co., Salford, Eng., planes 24 in. wide, 48 in. high, 18 ft. long, automatic cross, vertical and angular feed, platen driven by gearing into step rack, return motion about 10 in.; has third upright with vertical tool slider, automatic feed, to plane work that will not pass between the regular uprights. This slider has a vertical movement of 5 ft. 4 in. Counter-shaft.

HOLYOKE MACHINE CO.,
Holyoke, Mass.

SPECIAL NOTICE.
The undersigned offer their services as agents to American Producers of Metals.

They represent foreign brands of
Zinc, Russia Iron, Hoop Iron, Window Glass, Cutlery and Guns.

LOUIS WINDMULLER & ROELKER,
20 Reade Street, N. Y.

J. H. JENKS & CO.,
Manufacturing Machinists

180 Centre Street, New York,
are prepared, with a superior equipment of first-class tools and experienced mechanics, to contract for the designing and construction of special tools, dies, jigs and gauges for duplicating interchangeable parts of fine machinery or sheet metal goods. Contracts for manufacturing staple goods in quantity solicited.

TRAVELING SALESMEN WANTED.
Those that have a first class trade and are thoroughly acquainted with the Iron Founders of the United States. Address, with references,
B. J. C., Box 22,
Office of *The Iron Age*, 53 Reade St., N. Y.

Special Notices.

W. GARNER,
General Merchant,
Mouldsworth, near Chester, England,
Supplies nearly every class of Goods,
including all kinds of

Agricultural Machinery, Domestic Machines, SEWING MACHINES

And Artificial Manures.

W. GARNER is open to represent any Foreign Manufacturers in England for the sale of their manufactures of whatever nature or kind. Having a wide and well established connection in the Provinces, could introduce some American, German and French products to mutual advantage.

W. GARNER is also open to buy any kind of Goods on commission, and ship them to any part of the world. Manufacturers or others desiring his assistance will please address (with full particulars in English) as above.

Second-Hand Machinery.

One 14 in. x 30 in. Whitehill & Smith Adj. Cut-off Engine, Wheel 10 ft. diam., and
One 54 in. x 16 ft. Tub'r Boiler for same; both almost new.
One 10 in. x 24 in. Flashing Landing Engine, and
One 4 in. x 14 ft. Tub'r Boiler for same.
One 10 in. x 24 in. Harris Corlies Engine, with Boiler, Pump and Heater, never run, price very low.
One 20 in. x 17½ ft. Engine Lathe, Rod and Cross Feed.
One 22 in. x 16 ft. Engine Lathe, Rod; all improvements.
Two 15 in. Pratt & Whitney Engine Lathes, with Taper Attachment. One Lincoln Gear Cutter, nearly new.
Two Lincoln Milling Machines. Four Brainard Milling Machines. One each 1, 2, 3 and 4-spindle Drills, Pratt & Whitney. One No. 6 Root Blower. One 12 lb. Merrill Drop Hammer, good as new. 70 feet 2 in. Double belt 38 ft. 10 in. Double Belt.

E. P. BULLARD, 14 Dey St., New York.

AUSTRALIA.
AMERICAN HARDWARE CO.,
No. 9 WILLIAM STREET, MELBOURNE, AUSTRALIA.

Solicit correspondence with American manufacturers desirous of representation in the Australian Colonies. Consignments will have prompt attention. References furnished.

For Sale,
Hardware, stove and implement business, located in one of the best towns in northeastern Missouri. Stock will invoice \$5000. Will sell all or part. Reason for selling, wish to engage in wholesale trade. For further information, address
J. N. ALLEN,
Kansas City, Mo.

The Sherman Process Co.
9 Pemberton Square, Boston, Mass.,
Issue Licenses to use the Process for the Manufacture of Iron and Steel

In the Bessemer Converter, Crucible, Siemens-Martin, Puddling, Blast and Cupola Furnaces. The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working. See page 17 of *The Iron Age* of Oct. 25th, 1877.

Wanted—A Partner,
In a foundry and machine business, already well established. Locality splendid and healthy.

A practical man with means is wanted to join a practical man who is already well established.
Address
OAR WHEEL FOUNDEY,
P. O. Box 134, Selma, Alabama.

To Manufacturers and Jobbers of Hardware, Cutlery, &c.
Manufacturers and Jobbers, having surplus stocks or goods that from any cause are unsaleable upon which they wish to realize, or assignees who have stocks to dispose of, will find a cash purchaser by communicating with
W. M. CALDWELL,
Dealer in
Job and Auction Lots of Hardware, Cutlery, &c.,
109 Chambers St., New York.

Price Books.

Large Size, Full Leather.....\$12.00
"Half".....10.00
Pocket "Full".....5.00
Send for circular.

BUELL LAMBERSON,
No. 97 Chambers Street, New York.

These books may also be had at publishers' prices of
WM. BLAIR & CO., Chicago, and
A. F. SHAPELIGH & CO., St. Louis.

FOR SALE.
Job Lots Hardware.
Great inducements to the trade. Two hundred dozen Handled Chopping Axes at a low price.

A. W. WHEELER,
141 Lake St., Chicago, Ill.

To Steel Manufacturers.

An energetic young man with scientific training, who has had experience in the manufacture of Bessemer and Crucible Steel, in preference to remaining unemployed would be willing to take a subordinate position with the prospect of being employed as blower in Bessemer or as melter in Siemens-Martin steel works. Highest recommendation as to integrity, character and ability furnished. A correspondence, which shall be strictly confidential, respectfully solicited.

Address, Box 1308, New York.

TRAVELING SALESMAN.
A young man, 27 years of age, having 11 years' experience, desires an engagement with a manufacturer, jobber or agent of Hardware, Plumbing, Gas and Steam Fittings, Tinware Supplies, or Stove and Hollow Ware. Has traveled in Ohio, and is willing to travel in any of the States. Can give good reference. Address, P. O. Box 126, Columbus, O.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, Sept. 25, 1878.

The past week has been very dull in the financial markets, nothing of interest having happened except the decline of $\frac{1}{2}$ in Consols in London, reflecting a popular fear that the Eastern question is not yet entirely settled, and that hostilities between England and Russia are possible in the near future. The local money market continues very easy. The rate on call loans is $\frac{1}{2}$ @ 2%; on prime business paper, 4 @ 5%.

The gold market remains without feature of general interest. All fluctuations during the week have been between $\frac{1}{2}$ and $\frac{3}{4}$ premium.

Government bonds have been firm during the week; State bonds steady; railway mortgages irregular, but generally higher. We give below the closing quotations of governments.

The stock market has been strong and advancing during the past few days. The principal dealings have been in Lake Shore, Northwest, St. Paul, and D. L. & W. All the coal stocks are heavy.

The changes in the averages of the New York banks during the past week are not very large nor important, the net result being a reduction of only \$34,450 in the surplus reserve, which now stands at \$12,535,200. The following are the figures:

The foreign trade movements for the week are shown in the following tables:

For week ended Sept. 21:

Total for week... \$5,350,551
Previously reported... \$5,350,551

Since Jan. 1... \$12,535,200

Included in the imports of general merchandise were articles valued as follows:

	Quantity.	Value.
Amvils	187	\$1,708
Brass goods	33	5,385
Bronzes	35	6,705
Chains and anchors	25	255
Copper	54	15,490
Cutlery	710	710
Gas fixtures	12,163	12,163
Guano	711	711
Hardware	3,033	3,033
Iron, pig, tons	1,247	1,247
Iron, other, tons	1,117	1,117
Lead, pigs	1,535	1,535
Metal goods	137	17,113
Nails	1	109
Needles	8	2,670
Old metal	4	4,265
Plated ware	8	169
Per. caps.	28	4,055
Saddlery	3	1,010
Steel	13,511	13,511
Spelter	8,782	8,782
Silverware	8	1,811
Tin, bxs.	8,546	39,411
Tin, 162 slabs	137,011	137,011
Wire	10	3,048

EXPORTS, EXCLUSIVE OF SPECIE.

For week ended Sept. 24:

For the week... \$5,350,475
Previously reported... \$5,350,475

Since Jan. 1... \$12,535,200

EXPORTS OF SPECIE.

For week ended Sept. 21:

Total for week... \$25,000
Previously reported... \$25,000

Total since Jan. 1, 1878... \$10,444,663

Same time in 1877... \$2,053,357

Same time in 1876... \$4,872,174

Same time in 1875... \$4,404,045

Same time in 1874... \$4,387,331

Same time in 1873... \$5,638,178

Government bonds were firm throughout, closing at the following quotations:

	Bid.	Asked.
U. S. Currency 6's	119 1/2	119 3/4
U. S. 6's 1881 registered	107 1/2	108
U. S. 6's 1881 coupon	107 1/2	108
U. S. 6's 1885 new reg.	107 1/2	108
U. S. 6's 1885 coupon	107 1/2	108
U. S. 6's 1887 reg.	105 1/2	105 3/4
U. S. 6's 1887 coupon	105 1/2	105 3/4
U. S. 6's 1888 reg.	107 1/2	108
U. S. 6's 1888 coupon	107 1/2	108
U. S. 10-40 reg.	106 1/2	106 3/4
U. S. 10-40 coupon	106 1/2	106 3/4
U. S. 4's 1881 registered	103 1/2	104
U. S. 4's 1881 coupon	103 1/2	104
U. S. 4's 1883 registered	103 1/2	104
U. S. 4's 1883 coupon	103 1/2	104
U. S. 4's 1897 registered	99 1/2	100
U. S. 4's 1897 coupon	99 1/2	100

The following were the closing quotations of active shares:

	Bid.	Asked.
Atlantic and Pacific Telegraph	26 1/2	27
Chicago and Northwest	38 1/2	39
Chicago, Rock Island and Pacific	118 1/2	119
Chicago, Bur. and Quincy	111 1/2	112
Chic. Col. and Ind.	32 1/2	33
Cleveland and Pittsburgh	82 1/2	83
Chicago and Alton	83 1/2	84
Canton	101 1/2	102
Delaware, Lack. and Western	53 1/2	54
Delaware and Hudson Canal	49 1/2	50
Express-Adams	105 1/2	106
" American	49 1/2	50
" United States	49 1/2	50
" Wells, Fargo & Co.	92 1/2	93
Erie	13 1/2	14
Harlem	137 1/2	138
Hannibal and St. Joseph	35 1/2	36
Illinois Central	81 1/2	82
Kansas and Texas	37 1/2	38
Lake Shore	67 1/2	68
Michigan Central	70 1/2	71
Morris and Essex	30 1/2	31
Milwaukee and St. Paul	30 1/2	31
" Pref.	70 1/2	71
New York Central	113 1/2	114
New Jersey Central	35 1/2	36
New Jersey Southern	1 1/2	2
Ohio and Mississippi	7 1/2	8
Pacific Mail	70 1/2	71
Panama	124 1/2	125
Pittsburgh and Fort Wayne	97 1/2	98
Quicksilver	12 1/2	13
St. Louis Kansas City Northern	4 1/2	5
Tokio, Wabash & Western	20 1/2	21
Union Pacific	18 1/2	19
Western Union Telegraph	95 1/2	96

GENERAL HARDWARE.

The condition of the market is much the same as at our last writing. Business continues active, and prices are, as a rule, firm. No changes in values have transpired during the week.

The demand for Nails is firm at unchanged prices. We continue to quote rod. to 60d., \$2.15 @ \$2.20, net, according to quantity. Clark & Co., Buffalo, N. Y., have issued a circular under date of the 20th inst., in which they quote their No. 1, 3 and 5 Improved Patent Blind Hinges at the following list, which is subject to discount 65 and 10 per cent:

Clark's Improved Blind Hinge Price List.
No. 1. For wood, throws the Blind $\frac{1}{4}$ inches from the casing... \$3.50
No. 3. For brick, throws the Blind $\frac{3}{4}$ inches from the casing... 5.25
No. 5. For brick, throws the Blind $\frac{1}{2}$ inches from the casing... 10.00

We have received the following circular:

NOTICE TO THE TRADE.

BUFFALO, N. Y., Sept. 23, 1878.
Understanding that, owing to the popularity and large sale of our "Noiseless Blind Hinge, No. 50" patented March 19, 1878, Clark & Co., of this city, have put in market an entirely different article, in imitation; and having pirated both the name and trade number of our Hinge, and endeavoring to sell their Hinge, representing it as "Noiseless Blind Hinge, No. 50," we deem it proper to notify the trade that we are the sole manufacturers of Shepard's "Noiseless" Blind Hinges, and that the patent is owned exclusively by us.

Parties ordering should not be deceived by the imitation Hinge offered by Clark & Co. under the name and trade number used by us, and should order only the genuine Shepard's "Noiseless" Blind Hinge; which, it is perhaps needless to say, has the well-known reputation of being the only Blind Hinge that positively prevents rattling of Blinds.

The Southwark Hardware Co., of Philadelphia, have placed on the market a Toy Scale, which is illustrated in their advertisement on page 24, and to which we invite attention. It is a neat little article and is intended to combine pleasure and instruction. They say of it: "It gives children their first lesson in business, teaches them to calculate and prepares them for future usefulness."

F. A. Hull, Danbury, Conn., advertises on the opposite page a large lot of Machinery and Tools, which he informs us will be disposed of regardless of cost. The established business of the Hull & Belden Co., good will, &c., will be given to any party who will purchase enough of the outfit to carry on the said business and keep the same in Danbury. In the advertisement referred to further particulars regarding the property will be found.

IRON.

American Pig.—We hear of considerable inquiry for Pig Iron this week, and there is in consequence a better feeling and more life to the market than we have noticed for some time. The sales reported are 500 tons Poughkeepsie No. 2 at \$14.15 at works, 500 tons Manhattan No. 2 X at \$15.25 at works, and 200 tons No. 1 Lehigh in lots on private terms. We quote as before: Foundry No. 1, \$16.50 @ \$17; Foundry No. 2, \$15.50 @ \$16.50; Gray Forge, \$14.50 @ \$15.50.

Scotch Pig.—The demand for Scotch Iron continues light, and the only sales we hear of are of small retail parcels. We hear of the arrival of 300 tons. We quote, in a small way: Glangarnock, \$23.75; Eglinton, \$22.75; Coltness, \$24.

Rails.—We hear of considerable inquiry for Iron Rails, but no transactions are reported. In Steel Rails the only transaction which has come to our notice is a lot of 200 tons Light Rails, on private terms. We quote as before: Steel at mill, \$43 @ \$44; and Iron, according to quality, terms, &c., \$32 @ \$36.

Old Rails.—Sales of 2000 tons Old Rails are reported, on terms which have not transpired. We quote, nominally, \$17 @ \$18.

Scrap.—We hear of a sale of 500 tons No. 1 Wrought, on private terms. We quote the same from yard: \$20 @ \$21.

METALS.

Copper.—There has been a steady, fair demand, not heavy, but quite satisfactory, and 300,000 pounds Lake Superior have changed hands at 16 $\frac{1}{2}$ @ 16 $\frac{3}{4}$, which is at the same time the closing figure. Baltimore may be quoted 16 $\frac{1}{2}$ ¢, nominally. Nothing has transpired in futures. There are no late cable quotations from England, and the presumption is that the market on the other side has undergone no change worth while telegraphing. Mail advices have reached us from London to the 14th inst., when the market was steady; Tough Ingots, \$267; Best Selected, \$268, and Sheets, \$271. Nothing of an exciting nature has reached us from Chili with reference to the dispute with the Argentine Republic. We have read the papers from Santiago, the Chilean capital, brought by the last mail from Panama, and find the tone pervading them extremely moderate, cool and conciliatory; at all events, a great deal more so than the papers from Buenos Ayres bearing the same date, which we received via England. If these papers from Chili represent the public sentiment, it seems evident to us that the whole matter will soon be settled in an amicable manner, since the Chilean government and people clearly do not care to be drifted into war while their internal affairs demand their undivided attention. The combination prices for manufactured Copper are unchanged, but to a great extent nominal. Yellow Sheathing Metal is dull and irregu-

lar. American is quoted at 13 $\frac{1}{2}$ @ 13 $\frac{3}{4}$ ¢, with some inquiry, but English is not in request at the moment. We quote: New Sheathing Copper, 26 $\frac{1}{2}$ ¢; Braziers, 28 $\frac{1}{2}$ ¢, and Bolts, 28 $\frac{1}{2}$ ¢; American Yellow Sheathing Metal, 13 $\frac{1}{2}$ ¢ @ 13 $\frac{3}{4}$ ¢; Yellow Metal Bolts, 25 $\frac{1}{2}$ ¢, and English Yellow Sheathing Metal, 12 $\frac{1}{2}$ ¢ @ 13 $\frac{1}{2}$ ¢, currency, in bond.

Tin.—Our market is a trifle firmer, owing to some increase in the demand and smaller prospective supplies. We quote, in large lots, Straits, 13 $\frac{1}{2}$ ¢ @ 13 $\frac{3}{4}$ ¢; Australian, 13 $\frac{1}{2}$ ¢ @ 13 $\frac{3}{4}$ ¢; English Refined is nominal; ditto Common, 13 $\frac{1}{2}$ ¢, and Banca, 16 $\frac{1}{2}$ ¢ @ 16 $\frac{3}{4}$ ¢. The Glamis Castle, alluded to in our last report, has made her appearance with 4630 slabs Straits Tin, of which about 2000 slabs had been sold previously at 13 $\frac{1}{2}$ ¢. London cables \$56. 10/ for Straits, and Singapore, \$17.75 per picul. The Banca sale of 24,200 slabs at Rotterdam yesterday, is supposed to have gone at 37 guilders the 50 kilos. The London Mining Journal of Sept. 14th has the following passage: "The price of this metal has not undergone much variation, and considering it has had a good drop lately, holders will be acting prudently by waiting to see the effect produced upon the market. In the event of the Australian shipments decreasing for a short time, which is not unlikely to be the case, as they have been pretty large up to date, the present value will, no doubt, be fully maintained, and perhaps higher prices obtained, and any particular falling off would bring about a sharp reaction. A transaction has taken place at the close at \$57. 17/6, three months prompt, which rather shows the favorable disposition and views of buyers, otherwise they would not buy forward, besides paying an advanced price for the prompt." The stock of Tin Plates is light, and the market is fairly firm. We quote large lines of ordinary brands, per box, as follows: Charcoal Bright, \$5.75 @ \$6; Terne ditto, \$5.37 $\frac{1}{2}$ ¢ @ \$5.50; Coke Tin, \$4.70 @ \$4.80; ditto Terne, \$4.62 $\frac{1}{2}$ ¢ @ \$4.75. In writing from Liverpool (12th inst.), they express themselves to the following effect: "During the past week the stock of Cokes referred to in our circular of the 5th instant has been sold at prices varying from 13/3 to 13/6 per box. This is having the effect of forcing some of the needy makers to accept a similar figure in order to obtain orders. Charcoal Tins and Terne are far from strong, though not quite in the demoralized condition of Coke Tins. Coke Terne are little inquired for, and the make is so limited that prices are nominally maintained." Export to the United States, Jan. 1 to Sept. 1, 69,755 tons, against 70,270 in 1877 and 59,214 in 1876.

Lead.—Holders are more anxious to do business than buyers, and we are told that several lots have been quietly sold below 3 $\frac{1}{2}$ ¢, some 500 tons are thus being spoken of, but we cannot trace this to a reliable source. There were sold in the open market 100 tons at 3 $\frac{1}{2}$ ¢, and at this figure the market is flat at the close. Fine Lead is also dull at 3 $\frac{1}{2}$ ¢ @ 3 $\frac{3}{4}$ ¢. Lead has again declined 2/6 in England, where English Pig was obtainable at £16. 2/6; Sheet at £16. 5/; and Spanish Pig at £16. The market for Manufactured is quiet and steady at manufacturers' prices, which are unchanged. We quote Bar, 5 $\frac{1}{2}$ ¢; Pipe, 5 $\frac{1}{2}$ ¢; Sheet, 6 $\frac{1}{2}$ ¢; Tin-lined Pipe, 12 $\frac{1}{2}$ ¢; No. 1 Solder, 8 $\frac{1}{2}$ ¢, all less 10% to the trade.

Spelter and Zinc.—Common Domestic Spelter is extremely dull here at 4 $\frac{1}{2}$ ¢ @ 5 $\frac{1}{2}$ ¢. There is no Silesian here to speak of, and we quote the same nominally 5 $\frac{1}{2}$ ¢. At London the price of the Silesian had declined to £17. 15/; while Hard was in fair request at £17 to £18. 10/; Sheet Zinc.—The market is quiet and nominal. We quote: Domestic, 6 $\frac{1}{2}$ ¢ @ 6 $\frac{3}{4}$ ¢, and Mosselman, 7 $\frac{1}{2}$ ¢ @ 7 $\frac{3}{4}$ ¢.

Nickel.—Is very dull. We quote the same \$1.05 @ \$1.30, nominally.

Antimony.—has been very quiet at 12 $\frac{1}{2}$ ¢ @ 12 $\frac{3}{4}$ ¢, as to brand; London remains unaltered at £50 @ £52.

COAL.

Contrary to the usual rule, the Scranton auction sale, which took place yesterday, had very little effect upon the market in any way. The Lehigh Valley circular, which had been issued for the month of October, was considerably below the circular figures of the other companies, and had the effect of establishing the market, so that when the sale took place the market was made to a certain extent. The policy of the Lehigh Valley Company is to hold prices at about the present figures, which they contend are sufficient to produce a fair profit. They say that any considerable rise would, by reducing consumption, especially in the steam engines, produce more harm than good. The contracts which they have with their miners and some other questions of wages and tolls also help to confirm them in this opinion. Doubtless their current quotations, which to them are net, are as advantageous as any thing could be. The circular rates are very well sustained, and we hear that it is difficult to obtain any concessions. The demand is active, especially in the retail trade. The domestic demand in and about this city is very good, the best this year so far. Freight is very low, 90 cents to Boston is quoted, and we hear that many are taking advantage of this to fill up stocks. This is some 60 cents below the ruling figures of last winter, and the difference provides a very fair margin against a possible fall in prices.

Below we give the figures of the Delaware, Lackawanna and Western Railroad Company's 15th auction sale, held yesterday, for which we are indebted to Mr. Seward. Fifty thousand tons of Scranton Coal were disposed of, deliverable at the company's Coal wharf, at Hoboken, N. J., during the month of October:

	Average	Price sold at last mo th
Lump	3.11	3.11
Steamer	3.11	3.11
15,000 Grate	3.55	3.57
10,000 Grate	3.65	3.70
20,000 Grate	3.75	3.80
5,000 Chestnut	3.55	3.57

A comparison with previous sales this year is appended:

	Jan. 30.	Feb. 27.	Mar. 27.
Steamer	3.10	3.11	3.25
Grate	3.12	3.07	3.21
Chestnut	3.14	3.15	3.40
Grate	3.17	3.55	3.62
Chestnut	3.12	3.00	3.18

	May 1.	May 29.	June 26.	July 31.
Steamer	3.30	3.42	3.47	3.47
Grate	3.30	3.42	3.47	3.47
Egg	3.45	3.56	3.58	3.58
Stove	3.76	3.75	3.88	3.90
Chestnut	3.15	3.25	3.25	3.25

The following is the circular of the Lehigh Valley Company:

	Lp.	Str.	Bro.	Egg.	Sto.	Ch't.
Spring Mountain	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10
Lehigh	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10
Spring Brook	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10
High	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10
Jeddo Lehigh	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10
Highland Lehigh	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10
Packer Lehigh	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10
Wyoming	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10
Franklin (Wilkes-barre)	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10	\$4.10

These Coals are deliverable on board vessels at Perth Amboy, N. J. It is to be remembered that these prices are net, no discounts being allowed. Up to the time of going to press the circular of the Pennsylvania Coal Company had not been issued, but Mr. Hoyt said that prices would be unchanged, except that stove and chestnut would be advanced five cents. This practically leaves the circular the same as last month so far as large consumers are concerned.

EXPORTS.

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending Sept. 24, 1878:

	Quan. Value.	Mach'y, pkgs.	185	4,660
Lea. Belt, cs.	6	1,783		
Tinware, cs.	14	438		
Mf. iron, pkgs.	5	134		
C'ge m'tls, pkgs.	105	180		
Cutlery, cs.	85	85		
Hdw., cs.	79	2,261		
Pumps, pkgs.	2	455		
Ag. imp., pkgs.	2	455		
Hdw., cs.	5	1,100		
Spelter, slabs	2,775	8,700		

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Pl'd ware, cs.	13	738	lombia.	
Pumps, pkgs.	13	800	Rifles, case....	1 8
Hdw., cs.....	13	385	Locomotive....	1 5,000
Mf. iron, pkgs.	8	250	Revolvers, cs.	1,610
			Ag. imp., pkgs	7 4
			Belting, bales.	2 299
			Copper, case..	1 100
			Hdw., cs.....	343 3,410
Liverpool.				
Mach'y, cs.....	119	13,056		
Belting, case.	1	241		

(Review, Universal).

BRUSSELS, Sept. 8, 1878.—*Iron*.—There have been good many inquiries, but of actual contracts passed there have been comparatively few. Inquiries have been made for rails, for sleepers, for broad, and some contracts will probably result herefrom for the winter season. The Bolt works of Belgium are doing well, being in receipt of large orders from England and Russia. The metallic road system of Severn and Mersey (Iron Sleepers) as for the first time been introduced into Belgium in the Grand Central Belgian line between Walcourt and Berzee, near Charleroi, as well as on the Belgium coast line between Ostend and Bruges, near Liege. The rails have been laid very rapidly, the work being done over night and in the morning the trains have been moving on as before. The government will adopt this system without delay. The American Society of Civil Engineers, of the same system near its works. The Belgian Commissioners at the Paris Exhibition have circulated a notice among Belgian exhibitors calling their at-

tention to the fact that so few of them distribute pamphlets, catalogues and price lists to the visiting public on the grounds, and inviting them still to remedy this omission, which places Belgian goods at a disadvantage, as compared with those of other nations at the great international show. Coal.—Last Thursday there came off the great adjudication for the furnishing of coal to the state railways. The government has got its supply at ridiculously low figures, the range, as to quality, being between 5.50 and 6 francs, mixed and small. At Liege small coal went at an average of 5.50. Since this sale took place there has been a great deal of anxiety manifested to sell at rates thus established.

GERMANY.

(Borsenallee).

HAMBURG, Sept. 25, 1878.—Metals.—The revival in trade which is generally felt early in September does not yet show itself, nor are people in Germany very sanguine as regards the fall demand this year, for the simple reason that the crops after all are not so abundant in this and other countries as they were represented to be, which tends to restrict the laying in of winter supplies by dealers and the retail trade. Metals feel a less promising outlook at once, and unfavorably situated as most of them are from a statistical point of view, increased weakness is perceptible forthwith. Copper has been very quiet. Berlin, however, remains steady at 70 1/2 to 73 1/2 marks the 50 kilos, for good quality English and Australian, and 71 to 73 1/2 Mansfield. We quote Drontheim, 78; Minnesota, 85, and Tough Cake, 69 to 70. Tin.—Great weakness still characterizes our markets. Berlin quotes Banca 71 1/2 to 72 marks the 50 kilos, English refined, 67 1/2 to 68. We quote Banca here 71 to 72, and English 70 to 73. Lead.—Our markets are inanimate and weak. Berlin quotes Tarnowitz, Hartz and Saxonia 15 1/2 to 17 marks the 50 kilos. We quote here as follows: English Pig, 18 1/2 to 19; Sheet, 19 to 20 1/2; German Pig, 18 to 18 1/2; Spanish, 20 to 20 1/2, and other brands 18 1/2 to 19. Stocks continue light, and if the demand were to revive we should see some improvement. Berlin quotes 18 1/2 to 19 marks the 50 kilos. We are 18 1/2 here, and Breslau quotes Hohenlohe, 17 1/2.

HOLLAND.

(Koch & Vlierboom).

ROTTERDAM, Sept. 25, 1878.—Tin.—There has been a further decline. Banca has sold at 37 1/2 guilders, and subsequently at 37 1/2 the 50 kilos. Billiton opened at 33 1/2, but finally gave way to 35 1/2, and even at these low rates the sales made were insignificant. There will be sold in this city on the 26th inst. 2,000 cwt. Banca Tin on behalf of the Netherlands Trading Society. Prices have now declined to such a low figure that it will be of interest to examine their course since 1875. Lead is dull; Stobben is procurable at 1/4 and Eschwell at 1/2 guilders the 50 kilos.

EAST INDIES.

(Dummler & Co.).

BATAVIA, JAVA, July 29, 1878.—Tin.—About 10,000 piculs Billiton will be offered at auction on the 14th proximo, instead of 9,000 as previously announced. Coal continues in large supply, and is difficult to sell. West Hartley has been sold at 21.50 guilders per ton. Exchange.—Rates have undergone no change of importance, and there has again been little doing. Quite recently the tendency is decidedly more in buyers' favor, and quotations close weak. We quote private bills on London 11.50 to 11.55.

(Gillilan, Wood & Co.).

SINGAPORE, Aug. 10, 1878.—Tin.—In spite of lower prices in London, our market is unchanged, small supplies and a native demand for China having supported prices, and the market closes steady at 18 1/2 to 19 per picul. The Glamis Castle, which sailed for New York direct on the 8th inst., took 120 tons, which comprised 74 cwt. Banca, 46 cwt. Billiton, and 10 cwt. of tin. The shipments of tin from the Straits settlements to the United States have been, since the beginning of the year (seven months), 37,785 piculs, against 32,908 in 1877, 26,507 in 1876, 31,660 in 1875, 23,734 in 1874, 19,741 in 1873, 24,832 in 1872, and 20,919 in 1871, while in 1870 they reached 36,253, being nearly as much as this year. Tin.—There is no change in rates generally, and no prospect of immediate improvement. The Edward Perceval is all but a full ship. The Glamis Castle took 318 piculs Tin. The steamer Gordon Castle, due here on the 13th inst., has room for Tin. Rates are quoted 10 for Tin, and other goods in proportion. For Boston there have been no charters, and the berth is vacant. Exchange has declined to 3/10 for six months' sight credit drafts on London.

(Attkin, Spence & Co.).

COLOMBO, Ceylon, Aug. 2, 1878.—Plumbago.—Prices are unaltered, and the market is quiet. Some is going forward to London for China having support. The shipments of Plumbago since October, 1877, have been to England, 32,255 cwt.; to Malacca, 225; to India, 259; to Australia, 106, and to the United States, 17,591; together, 50,740, against 57,558 in 1877, 45,654 in 1876, and 44,334 in 1875. Exchange.—Bank closing rates, buying: Credits, 7/8; documents, 1/10 to 1/12. There is no demand.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

LONDON, ENG., Sept. 10, 1878.

THE STEAMBOAT DISASTER

on the Thames at Woolwich, of which very full accounts have been cabled over hence to your dailies, has been the one thrilling and all-absorbing horror of the week. The railway collision was bad enough in its way, but its results were as nothing when brought into comparison with the tremendous holocaust caused by the wreck of the Princess Alice. It strikes one with a peculiar home thrust when over 700 (that is the latest estimate) of one's fellow beings are drowned within nine or ten miles of their homes. No letter, public or private, going out of England, especially from London, just now would be complete or even be written at all without an allusion to the matter. The horror of the thing is indescribable. It grows on perusing the details, and moves one to an infinitude of sympathy with those who have in so many scores of instances been deprived of members of their families. London never received so severe a shock as this. It has ever since been the uppermost topic of public and private conversation—on change and in the streets, in railway carriages, in houses and tramway cars, as much as in the house of business and the domestic circle. I need not indeed I could not go into the sad details further than to state that the outcome of the various inquiries and investigations into the cause of the catastrophe is not unlikely to be the very material alteration of the present rules for passenger steamers. Hitherto their skins and general work have been of very light plates, not so stoutly stayed with knees, &c., as they ought to have been, and wholly devoid of bulkheads for securing water-tight compartments. In future there will be a rule laid down making water-tight compartments a necessity to secure a license to carry passengers.

THE STEERING QUESTION

will also be raised in connection with the complex problem as to the manner in which steering is affected by the operation of the screw when reversed. This important subject has never yet been fully bottomed, and it may be found that by reversing her en-

gines the Bywell Castle's helm acted in a manner precisely opposite to that intended.

THE STATE OF TRADE

in the iron making districts has to a great extent remained stationary since I last wrote, much disappointment being felt in all directions at the renewed complications in Bosnia and other parts of Eastern Europe, the anticipated and incipient revival of those markets having been paralysed afresh by the desperate and determined resistance of the Austrian occupation. From Southern Russia we have, it is true, encouraging news, the demand there and in the Caspian provinces for hardware and all kinds of cultivating machinery being agreeably large. The Indian market is passably good, and Egypt is taking a greater variety of goods than an outsider would give her people credit for using. From Australia recent advices contain news which is no doubt doubly welcome to certain British manufacturers, inasmuch as it narrates that American importations are being successfully combated by English goods. The reason for this change seems to be partly attributable to an increase in your prices, aided by keen cutting on this side. From New Zealand we are receiving some capital indents, and from Fiji and other scattered British Colonies the demand is not wholly unsatisfactory. The South American and West Indian markets are not overproductive just at present, and most of the home travelers are growing again, the harvest north of the Trent having been retarded and prejudiced by the spell of storms and wet weather which has prevailed. Taken as a whole, it now appears unlikely that we shall experience any "real jump" of trade in the remaining portion of the year 1878.

THE WIRE MANUFACTURERS

are evidently beginning to experience unpleasant sensations on the subject of foreign and American competition, if one may judge from the manifesto they have just issued to their workmen. They go pretty much all round the world in order to convince them that America, Germany, Belgium and so on are formidable competitors, and that not only have we lost a large proportion of our export trade, but have also caved in at home to the invading Belgian and the persevering German, both of whom have invaded the English and Scotch markets with remarkable—and the British manufacturers even admit with deserved—success. I do not propose to go over the sum total of the Englishmen's grievances, inasmuch as you will no doubt obtain the details from other sources, but I may say that the men—the drawers, that is—have heard all that their masters have to say without showing any disposition to grant what is really in the wind, namely, reductions in wages. Whether they will ultimately make the concession or not has yet to be proven.

PROTECTION FROM FIRE

in London is believed to be by no means as complete and thorough as it might be. Last week a conflagration at a great Thames street oil wharf raged for nearly three-quarters of an hour before it was reached by the steam fire engines on the land and river, so that people are asking, What would have happened had the flames broken out in the silent and deserted night, instead of, as was the case, at 4 o'clock in the afternoon? In one word, the good citizens have called a public meeting to debate upon their unprotected condition, and others doubtless will follow. There can be no doubt that there is "grit" in their complaints, and that London requires thousands upon thousands of hydrants and fire-cocks fixing all over the thoroughfares, to say nothing of a rearrangement of the water mains. If any of your manufacturers are fired with ambition of a noble order, here is a chance for them to beat the Britishers hollow on their own most sacred ground.

OUR AUGUST EXPORTS,

as detailed by the official monthly returns of the Board of Trade, do not show to great advantage, their total value having been £17,303,533, as compared with £17,746,662 in August, 1877. It will be seen by the appended figures that in some classes of iron and machinery we have been doing more business, but our sales have been in many respects for less money than they were a year ago. Arms, ammunition and both kinds of copper compare favorably on the present occasion, but hardware and cutlery present an unusually poor appearance. Some of the principal statistics read as follows:

	1877.	1878.	1877.	1878.
Fire-arms, No.	10,400	10,444	819,375	798,785
Brass, manuf. of, not being ordnance, cwt.	9,400	8,125	47,811	33,779
Copper, unwrought, cwt.	17,758	24,125	80,005	84,095
Copper, wrought, " "	17,758	24,125	70,144	75,354
Mixed or yellow metal, sheeting, cwt.	32,660	25,784	111,751	80,722
Hardware & cutlery, value, £	8,200	9,949	276,425	268,070
Iron, pig, tons	8,200	9,949	276,425	268,070
Bar, angle, bolt and rod, tons	22,306	19,813	171,035	138,734
R. B. of all sorts, tons	40,775	35,548	337,806	301,530
Hoops, sheets and boiler and armor plates, inclusive of galvanized, tons	10,570	15,300	228,495	204,844
Tin plates, tons	12,230	11,091	237,583	191,445
Ct. or wt. and all other manufs. (except ordnance unenumerated), tons	19,228	24,326	278,247	335,174
Old for manuf., tons	1,540	4,104	7,183	18,104
Steel, unwrought, tons	2,045	1,903	63,320	60,653
Manufactures of steel and iron, tons	988	974	50,520	65,815
Lead, pig, rolled sheet and tubing, tons	5,002	2,430	105,206	43,817
Steam engines, " "	18,972	18,440	154,814	231,887
Other descriptions, " "	18,972	18,440	494,795	495,071
Plate and plated and gilt wares, " "	10,981	12,104	14,438	15,521
Tin, unwrought, cwt.	10,981	12,104	39,011	45,677

Hardware and Cutlery.

	1876.	1877.	1878.
To Russia	18,611	15,928	29,802
Germany	17,355	17,170	15,588
Holland	9,360	6,905	7,083
France	20,552	20,110	20,368
Spain and Canaries	13,126	10,398	9,490
United States	31,686	26,041	31,210
Spanish West India Islands	8,193	9,350	5,232
Brazil	18,972	18,440	15,012
Argentine Republic	3,372	3,760	11,044
Brit. North America	11,509	12,402	11,154
British India	16,076	20,054	19,466
Australia	45,654	44,334	47,225
Other countries	83,505	80,018	80,009
Total	£270,441	£276,425	£268,670

Steam Engines.

	1876.	1877.	1878.
To Russia	18,611	15,928	29,802
Germany	17,355	17,170	15,588
Holland	9,360	6,905	7,083
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Total	£270,441	£276,425	£268,670

Brazil	2,188	3,099	9,636
British India	14,103	17,944	68,994
Australia	14,401	17,954	20,660
Other countries	77,656	78,874	57,220
Total	£202,067	£254,814	£211,837

Other Machinery and Millwork.

To Russia	1876.	1877.	1878.
Germany	£24,160	£26,417	£29,149
Holland	45,400	68,898	63,136
Belgium	17,413	14,574	18,549
France	23,195	22,661	17,130
Spain and Canaries	30,056	38,574	35,762
Egypt	24,830	27,047	15,422
United States	6,861	8,836	6,307
Other countries	13,106	8,836	9,842
Total	£202,067	£254,814	£211,837

Earthenware and Glass.

Month of August.	1876.	1877.	1878.
Earthenware	£159,786	£153,316	£1,127,058
Flint glass	21,494	20,552	152,493
Common bottles	23,779	25,351	206,308
Plate glass, incl'g looking glasses	8,754	6,719	60,439
Our chief imports for the month were:			
Copper ore, tons	14,118	7,928	£120,545
Unwrought or part wrought iron ore, tons	3,966	3,141	276,051
" " burs, tons	120,231	149,635	130,026
" " mfrs., cwt.	15,730	16,877	166,283
Steel, cwt.	154,719	159,604	143,280
Lead, pig & sheet, tons	493	248	5,394
Pyrites of iron or copper, sulphur, &c.	5,443	8,641	216,689
Tin in blocks, ingots, bars, &c., cwt.	60,993	50,359	145,750
Alabs & regulus, cwt.	33,622	39,885	111,264
Total	£202,067	£254,814	£211,837

THE TRADES UNION CONGRESS

opened at Bristol yesterday, about 140 delegates being present under the chairmanship of Mr. Bailey. In his opening address Mr. Bailey referred to the struggle of the past 12 months, during which period he had been vilified by the press. Employers had formed federations, and workmen must follow their example. He hoped the congress would throughout the week remember that their sole business was the moral and social welfare of those who had sent them there. The following delegates were then elected: President of congress, G. F. Jones, secretary of Bristol Trades Council; vice-president, John Kennedy, painter, Glasgow; secretary of congress, F. J. Hopkins, Bristol; treasurer of congress, John Burnell, London; auditors, Fitzpatrick, Liverpool, and Count Bristol. Standing orders committee—Parker, Glasgow; Shorrocks, Manchester; King and Smith, London; Sharples, Liverpool. Mr. Jones then assumed the presidential chair and thanked the congress for the unmerited honor conferred upon him.

SCOTCH PIG IRON

remains very flat, and there are no tokens of an early improvement. Out of 155 furnaces built there are 92 blowing. Of the total number, 107 are of the old-fashioned kind, and 48 are on the "gas" principle. Summerlee appears to have the largest number (18) of the newer sort at work, and Coltness next with 7. On the same date last year 37 furnaces altogether were in use. There are now 192,184 tons of pig iron in the stores at Glasgow, an increase for the week of 490 tons, and 34,000 tons over the aggregated figures this date last year. In makers' own yards, too, the stock held is very heavy. Ballast pig rules 42/6 alongside. Writing from Glasgow, September 6, James Watson & Co. said: The market for Scotch Pig Iron has been depressed this week, the price of warrants having declined to 47/6 per ton, cash, the lowest point touched since May, 1879. On Monday the market was steady at 48 1/2 per ton. On Tuesday it was weaker, business being done from 48/2 to 48 1/2 per ton. On Wednesday the market was flat, transactions taking place from 48/2 to 48 1/2 per ton. Yesterday the price further receded from 47/9 to 47/6 per ton, and to day it has been steady at the latter figure. The demand for makers' iron is dull and prices are in many instances reduced. Shipments last week were 8493 tons as compared with 9281 tons for the corresponding week of 1877. We quote:

	No. 1.	No. 2.	No. 3.
G. M. B., at Glasgow	47/6	47/6	47/6
Gartsherrie, " "	55/6	55/6	55/6
Summerlee, " "	57/6	57/6	57/6
Langloan, " "	58/6	58/6	58/6
Carnbroe, " "	59/6	59/6	59/6
Caldar, at Port Dundas	56/6	56/6	56/6
Levenmouth, " "	58/6	58/6	58/6
Eglinton, at Ardrossan	59/6	59/6	59/6
Dalmellington, " "	59/6	59/6	59/6
Shotts, at Leith	57/6	57/6	57/6
Kinnell, at Bo'ness	49/6	49/6	49/6

GLASGOW SEWING MACHINES

appear to be having a very wide celebrity, for a correspondent states that they not only go all over Britain and Ireland, the Continent and the nearer colonies, but to the antipodes in great quantities. He states, in fact, that the annual value of the sewing machines sent abroad from the Clyde is not under £60,000. The Howe Company, I may remark in passing, has its large factory at Glasgow. France is an important and increasing buyer of these most useful articles. I suspect, indeed, that not a few of the "French" machines à coudre in the Exposition were born on the banks of the Clyde.

IN CLEVELAND,

where the late Thomas Whitwell was so well known and so highly and warmly esteemed, there is a movement afoot to place on record some mark of the public worth of the man so terribly deprived of life. Probably a statue will be erected or some useful public building dedicated to his memory.

IN AND NEAR SHEFFIELD

trade is still unpropitious, and pretty nearly everybody is down in the most doleful of dumps. The only people who appear to be at all "live" are some of the Bessemer manufacturers, especially Brown, Bayley & Dixon (Limited), a concern which, under the talented management of Mr. Calvert Holland, is now pretty nearly at the top of the local tree. I have often predicted (as you know and your columns will testify) that it is only necessary now to point to the Sheffield share lists to feel the way the Stock Exchange wind blows. Mr. Holland is now fairly on his legs, and he has the proud pleasure of seeing his machinery, including

his "three-high" rolls, in lively operation, while other houses are fain to let their rail mills rust. Bolckow & Vaughan's are no doubt ahead, but Brown & Bayley's are close up, and some of their neighbors—"Tom" Hampton, of the Phoenix; Mr. Alexander, of the Cyclops, and the Dronfield people—think they "know a thing or two." John Brown's are very quiet, which is regrettable when one knows that their rail mill is about the finest structure of the kind in England. The mill, however, is too far away from the Bessemer pits, and, although the converters are the largest in Great Britain, the broad result is that J. B. & Co. have very few rail orders. Notwithstanding that, they are knocking all their competitors out in Bessemer plates and sheets, much to the consternation of some of the smaller local vendors thereof. In edge tools the business doing is on a fair but not hearty scale. Saws sell slowly, as do files. In small hand-saw files, I may say Warrington has pretty nearly superseded Sheffield in the home trade. Cutlery is quiet, and in electroplated ware movements are limited.

STAFFORDSHIRE AND BIRMINGHAM

are dull, which word pretty nearly summarizes all that can be said about the district. The failure of Zimmermann & Hoyland, United States, &c., merchants for £16,000 has been officially announced. Other stoppages are pretty certain to take place unless trade speedily mends. Some of the Birmingham factors have been hit pretty severely of late by the unusual number of builders' failures all over the country. Builders, I may add, appear to be chronically bankrupt on this island of ours—how do you manage to keep them straight?

SOUTH WALES AND MONMOUTHSHIRE

continue to be spasmodically excited by the reported probability of restarting at Cyfarthfa, but there appears to be no solid foundation for the rumor. Dowlais is moderately brisk, and some work is in course of execution at Landore, Tredegar and Ebbw Vale. At Tredegar "they" are talking of putting down a large steel plant. At or near Pen-y-darraig the first Welsh wire works is being mapped out. Bar iron is still being shipped to New York; who is it for? At the Melyn Tin Plate Works notices of cessations of contracts have been posted, and at Vernon the old sore is as yet unhealed.

THE METAL MARKETS

have been easy and comparatively lifeless. The Ironmonger reports: "Copper has fallen a little; about 150 tons of good ordinary brands Chili bars sold at £60 spot, at which the market remained steady. Wallaroo is quoted at £60. 10/ and Burra at £68. 10/. Tin is easier, with a moderate business at £58 to £57. 10/; English ingots, £62. 10/. Tin plates are in good demand, and some of the producers are endeavoring, but with small measure of success, to secure 6d. or 1/ per box extra. In this, however, they are palpably laboring under great disadvantages, owing to the enormous production in excess of the demand. Lead has sold at £16. 2/6 to £16. 10/ for English Pig, and soft Spanish at £16 to £16. 2/6 without silver. Spelter—Ordinary brands remain unchanged at £18. Zinc—At the public sale on Thursday Messrs. W. T. Sargent & Son sold 95 tons at £20. 10/. Quicksilver is unchanged at £7. Antimony at £49 to £50."

The official report of the London Exchange is: "Copper.—In Chili bars, 150 tons reported, £60; for G. O. B. and named brands also, 50 tons of G. O. B., spot, at £59. 15/; Wallaroo quoted £69. 15/; Burra, £68. 10/; English tough, £65. 10/ to £67; best selected, £67 to £68. 10/; strong sheets, £72. Tin.—Business in Straits and Australian at £57. 5/ at which the market closes steady. English ingots, £62. 10/. Iron.—Scotch pigs, 47/6, cash. Lead.—English pig dull at £16. 2/6 to £16. 17/6; soft Spanish, without silver, £16 to £16. 2/6. Spelter.—£18 for ordinary brands. Zinc.—No quotations. Quicksilver, £7. Antimony, £49 to £50."

LABOR NOTES.

The men at Mt. Vernon ore mines, Mes-tre-tat, Pa., are out against a reduction of 10 per cent.

The coal miners at the Richmond (Mo.) mines came out Sept. 2d for one cent per bushel advance over the price paid last winter. The operators met and offered to advance one-half cent on a six month's contract, which the miners refused and the lock-out still continues.

The ore miners at Mt. Vernon, Pa., have been locked out of the mines because they would not accept a reduction of 10 cents per ton.

The managers of the window glass works at Bellain, O., have abandoned the 20 per cent. reduction on the blowers' wages, but refuse to pay the cutters extra for sorting lights.

The coopers, at Bellain, O., are still out on strike, refusing to make nail kegs for \$1.75 per hundred. The former price paid was \$2.50.

Brazilian Credits.—The Boston Commercial Bulletin says: One of the questions most frequently asked by those who are considering the subject of Brazilian trade is: "How can American manufacturers expect to compete with the English manufacturers when the latter sell their goods on 18 months and two years credit?" Instead of being a hindrance, this very fact is a favorable element in the trade, the willingness of English merchants to give long credits being a guarantee of the financial soundness of purchasers. In a word, a bad debt is seldom made in Brazil among persons established in business; failures are very rare, and so long as large profits can be made and money is worth merely two and three per cent. per annum in England, a sale will be effected regardless of the terms. Our

INDUSTRIAL ITEMS.

MASSACHUSETTS.

The contract for furnishing the city of Lewiston, Me., with all the brasswork, stop-cocks, &c., used in connection with the service pipes of the new water works of that city, has been awarded to Wm. H. Gallison, Boston. All of this work is to be very heavy and of the best material. The services are to be put in and the connections made by Smith & Smith, of Lewiston, Me.

RHODE ISLAND.

Within the past few days the American Ship Windlass Company, Providence, have shipped an iron pump brake windlass to George E. Hand, East Setauket, L. I., to go on a schooner building for Yates & Porterfield, New York city. Also an iron brake pump for N. P. Kean, North Weymouth, Mass., for a pilot boat building for Boston parties. Also a No. 9 Emerson windlass and capstan for main deck for C. V. Minot's ship, building at Phippsburg, Me.; a pump brake windlass to Burhaus & George, 62 South street, New York, to replace a Perley windlass on a steamer; and to Jonathan May & Sons, an iron capstan windlass for a schooner building in Delaware for Capt. Fennimore. They have also shipped a No. 7 steam windlass for the steamship Saratoga, building at Chester, Pa., by John Roach & Sons, for James E. Ward & Co.'s steamship line of New York, and have nearly completed a messenger chain windlass for a steamship building by John Roach & Sons for Cuba, and a vertical windlass for the last of the Russian vessels. Thus the four Russian vessels will all have these windlasses. The Columbus had the Harfield London windlass and took it off, and the American Company put on one of theirs. The State of California had their steam pump brake on her when she was sold; also the Saratoga.

CONNECTICUT.

The Pratt & Whitney Company, of Hartford, shipped to England last month, for use by a watch tool company, a planer, 20 inch by 6 feet engine lathe with latest modern improvements, including arrangements for cutting screw threads to the metric standard, and a wire-straightening machine. Also, to Mexico, a 16 inch by 6 feet engine lathe with taper attachment; an upright drilling machine with index for gauging the depth of holes, drill chuck, twist drills, &c.

NEW YORK.

Prospects at the iron works are very encouraging. The mills of the Messrs. Burden are all running on full time except those upon the hill, which have been practically abandoned. The steel works will be kept busy for several months filling orders at present on hand, and at the other mills of Corning & Co. the outlook is very favorable.—Troy Times.

PENNSYLVANIA.

Messrs. Stokes & Parrish, of Philadelphia, have just completed two hydraulic elevators, one for Strawberry & Clothier, and the other for Darlington, Runk & Co., both leading dry-goods firms in Philadelphia, and both entering into new premises. The pressure is kept up to 60 lbs. to the square inch in the iron supply tank by means of small pumping engines, thus enabling them to use the same water over and over again. They are fitted with electric annunciators and all latest improvements, and appear to give entire satisfaction.

Nevegold, Schied & Co., Bristol, are exceedingly busy, running double time, with two sets of men. They manufacture all guages of hoop band iron, and turn out about 50 tons per week.

Corydon Winch, of Philadelphia, manufacturer of bar iron, spikes, and general railway supplies, is busy, with good prospects for the coming winter. He is at present employing 125 men.

E. L. & H. B. Banes, Bristol, engineers and machinists, have been very busy for some time. Their specialties are small engines of say 5 to 20-horse-power.

We have to record a still better achievement of the Warwick Furnace than those we have noted from time to time. For the week ending Sept. 14, the furnace made 368½ tons, principally No. 2 Foundry, 125 tons being No. 3 but very gray. It has been a question whether these results have not been obtained by pushing the furnace. We are assured that this is not so, the aim being to make only that amount of iron that can be reached consistent with good quality, safety and economy. The heat is kept at 800 to 900 degrees. Mr. Edgar S. Cook is entitled to great credit for his admirable management.

Considerable building in connection with iron works has been done in Johnstown this season. The Cambria Iron Company have added a new building to the steel works. Another wire mill has been built, and not proving large enough, considerable additions to it are being made. The Gautier Steel Company, from Jersey City, have their very large building about completed, and are now putting the machinery in as fast as possible.

We clip the following from the Sharon Herald of the 20th inst.: At Westernman Iron Works, puddle, guide, hoop and sheet mills double turn; bar mill single up until the first heat on the night turn for Friday, when everything went down on account of the rain. The Kimberly mill looks dead and silent; a few hands are employed in cleaning up and putting things ship shape. At West Middlesex, the Fanny Furnace stopped up Friday about noon, and is likely to remain stopped the remainder of the week, as the stock is not sufficient to run until the roads are in order. From Sharpville nothing special. The Douglas No. 2 is high and dry out of all danger, except its supply of limestone and coke. At the Stewart Iron Works, furnace No. 2 was stopped a couple of hours during the fracas, but no damage done the machinery.

The puddle mill of the Allentown Rolling Mill will start up this week, and the rail mill next week. An order has been received which will, it is said, keep the works going from six to eight weeks.

John M. Edson, one of the nailers in the employ of the Pottstown Iron Company, having charge of four of Gould's self-feeding machines, assisted by J. Shinehouse and Robert Slade, cut a grand total of 6100

pounds of nails, or 61 kegs, each keg containing 100 pounds. Messrs. Shinehouse and Slade each handled 3050 pounds of the nails. A run of 50 kegs of nails per week is considered unusually good, but the cutting of 61 kegs is surprisingly large.—Reading Eagle.

The Sharon Herald says: The stock of pig iron in the various furnace yards at Sharpville is remarkably light, and will not aggregate more than 1000 tons.

The Latrobe Car Works are building for the Pittsburgh, Newcastle and Lake Erie Railroad 20 eight-wheel ballast cars, 20 box cars, 20 drop bottom coal cars and two baggage cars. The first-named lot have already been delivered.

The mill of Kimberly, Carnes & Co. at Sharon ceased operations finally on the 13th, and the future of it is now with the Bankrupt Court. Some 500 men are thrown out of employment.

The Keel Ridge Furnace, Sharon, blew out on the morning of the 15th after a successful blast of 23 months.

The Middlesex Mill is running six furnaces single turn.

The Fannie Furnace, West Middlesex, is in blast, making 40 tons a day.

Messrs. Huston & Co., contractors for the completion of the Cincinnati Southern Railway, have awarded the contracts to a Philadelphia company for six iron trestles, two of which are 900 feet long, for \$150,000. The work on the road will be pushed forward rapidly.

PITTSBURGH AND VICINITY.

Cres, Graham & Co., of Allegheny, a new stove founding company, organized last year, are quite busy at present on grate fronts and their patent shaking grate, which is a most effective and at the same time simple arrangement.

The Lemont Furnace Company at Lemont Station are showing a very good record as to the uniformity of their product. In a run of six months they have had only 4 tons of No. 2 iron and 20 tons of any lower grade. The furnace is owned by Ewing, Hanna & Co., of Pittsburgh, and managed by Robert Hogsett.

Reynolds & Moorhead's furnace at Red Bank, up the Allegheny River, is running, but there is some talk of closing down. They have an accumulation of 16,000 tons of iron on hand, a perfect field of good mill iron.

In the week ending Sept. 14, the Rochester Tumbler Company shipped 13 carloads of tumbler—the largest week's work the company ever did. The works are, and have been for months, running to full capacity, viz.: three furnaces, the number of hands employed being over 300.

The Superior Mill resumed operations on Tuesday of last week after an idleness of five years. The first rolling done being some angles for the steel bridge over the Missouri on the line of the Chicago and Alton R. R.

Messrs. Hussey, Howe & Co. are erecting at their works a 7-ton Siemens-Martin furnace. This is the second that will be in operation in the Pittsburgh steel mills.

John Robson & Son, at their chain works, have but six of their 14 fires in operation at present, making chain from 1 inch down and working only on orders. They are introducing some important improvements, both in machinery for cutting the links and for welding them.

The Crescent Tube Works are quite busy employed, both in the butt and lap weld departments, working nearly 200 men. Important improvements have been lately introduced and others are in progress.

One of the oldest rolling mill firms in this city is bowing to the inevitable and arranging to put in its works a Pernot Furnace. The age of steel is on the march rapidly.

The mill of P. H. Laufman & Co., at Apollo, has been running double turn on sheet iron for the past six months, and present indications are that they will continue to run the same all the fall.

Lewis, Oliver & Phillips' lower mill, Allegheny, is running double turn in all departments.

NEW JERSEY.

The Trenton Lock and Hardware Company are very busy and likely to be so all winter. They are manufacturing among other specialties the Pelican money bank, on which they have had a large run. In a short time they will introduce several other useful and interesting specialties.

The American Saw Company, of Trenton, have got an injunction against J. E. Emerson, restraining him from manufacturing "slit" saws, the decision being that it is an infringement on the "perforated" saw patent which they control. They manufacture as specialties the movable tooth circular and perforated cross-cut saws. They have a new invention connected with the movable tooth, which will shortly be illustrated in this paper.

O. C. Bowman & Co., Trenton, manufacturers of terra cotta, are fully at work. They manufacture specially drain pipes, fire brick, &c.

Trenton Iron Company, Trenton, are exceedingly busy. They manufacture all kinds of wire, including screw binder spring, galvanized telegraph and pin wire. They are engaged in building a new tin shop and altering the buildings that were formerly the gun and ordnance works that they recently purchased. They have put one steam engine in these works and purpose putting two more in, which, when finished, they claim will be one of the finest and best equipped concerns in the country.

Charles Carr, now the Phoenix Iron Company, Trenton, are very busy and running full time. They manufacture all kinds of material for iron roofs, &c. This firm had large contracts for the material used in the New York Post Office.

WEST VIRGINIA.

The Benwood Mill started up in full blast on Wednesday the 18th.

OHIO.

F. Gerlach & Co., Cleveland, besides their home orders for stove and barrel machinery, have received a heavy order from Germany. Samples of stove-sawing machines for oil barrels and nail kegs are on exhibition at the Pittsburgh Exposition.

South Cleveland Advocate: The Old Mill stopped on Wednesday night for the purpose of putting a new foundation under the engine and rolls. It will probably take four

weeks before the mill will be ready to start again. For two or three days this week the heat, smoke and sulphur arising from the furnaces in the Old Mill were almost unbearable, and Mr. Wm. Garrett did a humane act on Wednesday when he caused vent-holes to be made in the roof directly over the furnaces, for which the men are extremely thankful. Last week over 5000 rails 30 feet long, weighing 52½ pounds to the yard, and measuring in the aggregate 28 miles and 693¼ yards, were turned out at the old rail mill of the Cleveland Rolling Mill Company. On Tuesday night and Wednesday of this week 902 rails were made, besides changing the rolls, all inside of 24 hours.

The Columbus Elbow Co. are running their shop to its full capacity, which is about 150 dozen elbows a day.

There are some good prospects of the rolling mill at Girard going into operation soon. Workmen are busily engaged making the necessary preparations, and a speedy resumption is an accepted fact. The mill has been idle since November, 1876. It is well arranged and ought to turn out some good iron. Its plant is 13 single boiler furnaces and two heating furnaces, double set of rolls in the muck mill, a 10-inch and one 8-inch mill.

The Girard Furnace is in blast. The Eagle Furnace, Youngstown, blew out last week, having been in constant blast for three years lacking four days.

ILLINOIS.

The stove works at Quincy are all running full time.

Messrs. Shumway, Burgess & Co., proprietors of the Continental Boiler Works, Chicago, as successors to the late firm of Burgess, Clarke & Co. (which was dissolved by the death of the senior member of the firm in January last), are now running the above works to their full capacity. They employ 30 to 35 hands, and will do a much larger business this year than last.

The Joseph H. Brown Iron and Steel Co., near Chicago, are now running both in the iron department and the nail mill. A new post office has been established at these works, called Brown's Mills Post Office, Cook county, Ill.

INDIANA.

The Chicago, Burlington and Quincy shops, at Aurora, recently turned out two heavy passenger engines with 17 by 24 inch cylinders. They have Challenger's patent smoke-stack. The car shops are turning out a large number of grain cars. The shops, which cover 30 acres, now employ about 500 hands, considerably under their usual number.

MICHIGAN.

There are rumors, says the Mining Journal, that the Grace furnace has been sold or leased to parties who will relight her fires at an early day, but we can trace them to no responsible source.

Not since the fall of 1873 has the outlook in this region been as bright and hopeful as at the present time.—Nevanue Herald.

THE "OLD RELIABLE" UNIVERSAL Clothes Wringer.



Improved with Rowell's Double Cog-Wheels on both ends of each roll.

Over 500,000 sold!

And now in use, giving "Universal" satisfaction.

EVERY WRINGER WARRANTED.

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B. W. PAYNE & SONS,
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Established in 1840.

Eureka Safety Power.

h.p.	cyl.	ht.	space.	wt.	price.
2	13½	4	48 in.	400 lbs.	\$150
3	18	5	54 in.	600 lbs.	\$250
4	24	6	60 in.	800 lbs.	\$350
5	30	7	66 in.	1000 lbs.	\$450

Also, Spark Arresting Portables and Stationary Engines for Flotation. Send for Circulars.

MACHINE MOULDED MILL GEARING.

AS ACCURATE AS CUT GEARING

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SHAFTING, PULLEYS AND HANGERS.
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ACKNOWLEDGED THE BEST IN THE MARKET!

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Patented August 17, 1875.

First Premiums were given to the TIFFIN at the following Fairs: Northern Ohio, 1874, 1875, 1876; Ohio State, 1873; Western N. York 1876; Central N. York, 1876; N. Y. State, 1876; Connecticut State, 1876, and a number of other State and County Fairs where exhibited.

It is a Right Hand Sheller. Frame made of hard wood, Shafts of wrought iron. The parts are carefully fitted, ensuring durability, and ease to the operator. The panels are tastefully painted and the frame neatly striped, and all the woodwork well varnished.

The Hopper is adjustable, rendering it capable of easy adjustment to either large or small corn as required. For price and terms, address

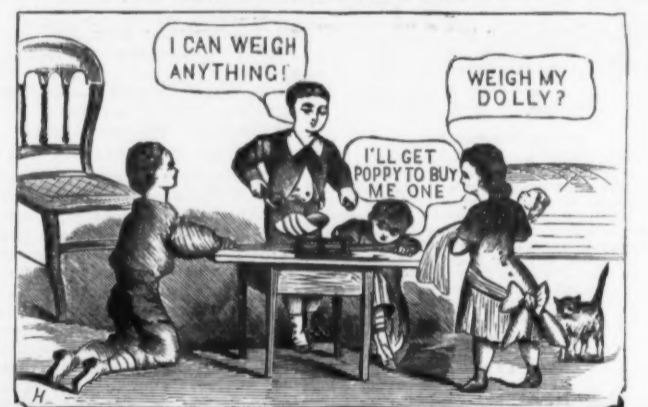
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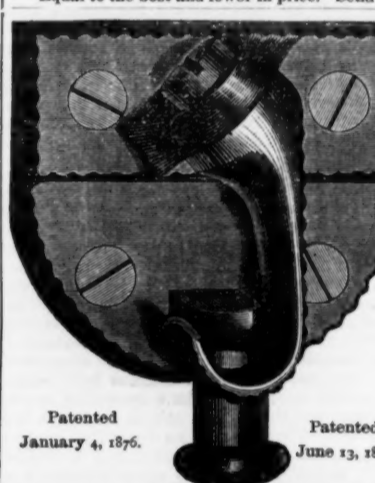
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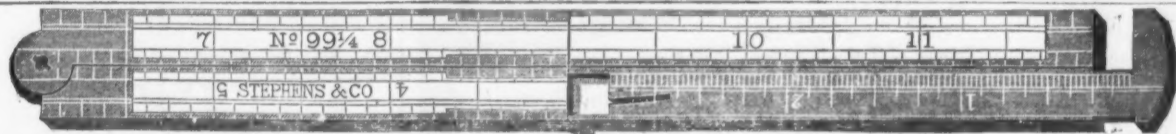
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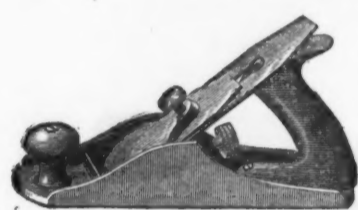
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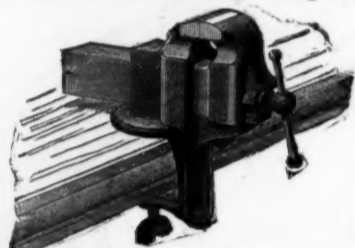
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GENUINE IMPROVED AND MECHANICS
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UNDER PATENTS DATED
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MARCH 23, 1869, FEBRUARY 23, 1864,
REISSUED 1870. REISSUED JUNE 1, 1869,
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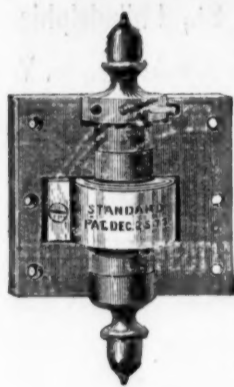
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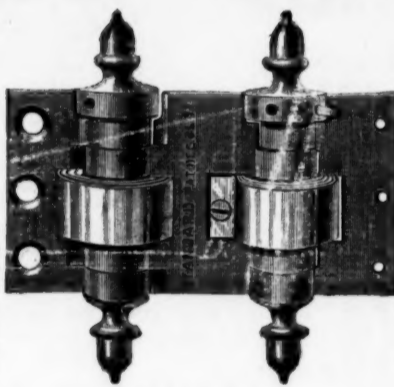


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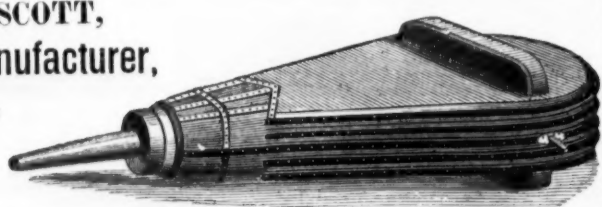
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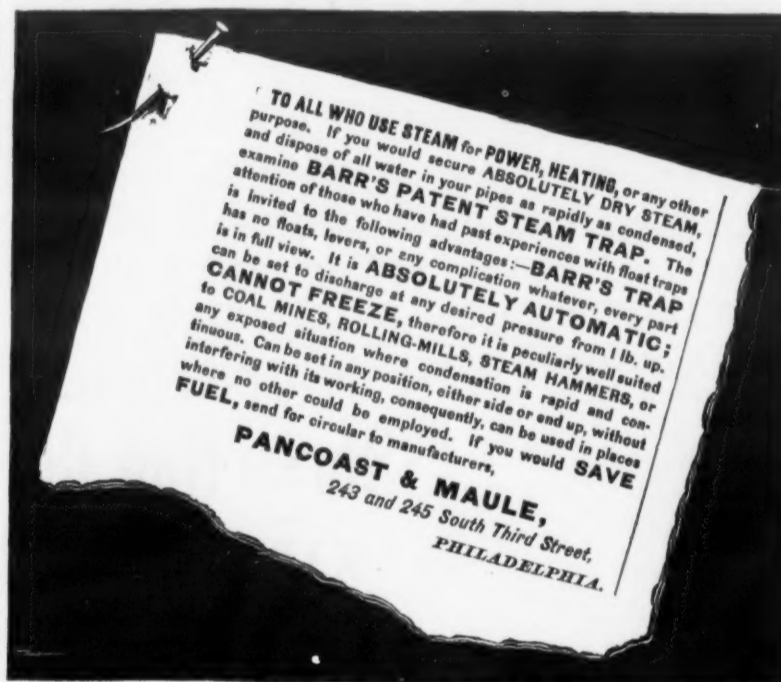
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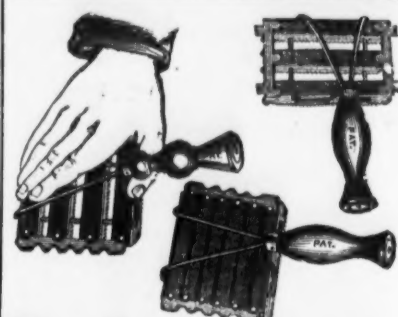
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The Iron Age Directory

and Index to Advertisements.

Page	Page
Agricultural Implements.	Engines, Locomotive.
Hubbard H. N., 222 E. 22d, N. Y.	Engines (Locomotive).
Clayton James, 11 Water, Brooklyn, N. Y.	Baldwin Locomotive Works, Philadelphia, Pa.
Alarm Money Drawers.	Engines, Steam.
Tucker & Dorey, Indianapolis, Ind.	Ervin Chas. W. & Co., Kensington, Phila.
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Richardson Mfg. Co., Worcester, Mass.	140 E. & W. B., Binghamton, N. Y.
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Ives Wm. A. & Co., New Haven, Conn.	McNab & Harlin Mfg. Co., 50 John, N. Y.
Jennings C. & Co., 25 Chambers, N. Y.	Penfield Block Works, Lockport, N. Y.
Axes, Edge Tools, etc., Manufacturers of.	Faucets, Self-Measuring, Makers of.
D. R. Barton Tool Co., Rochester, N. Y.	Enterprise Mfg. Co. of Pa., Phila. and N. Y.
James M. H. & Co., Cohoes, N. Y.	Feltz, Crane & Chapin, 31 & 33 Courtlandt, N. Y.
Axles, Springs, &c., Manufacturers of.	Files, Importers of.
Brown J. Arthur, New York, N. Y.	Carr J. & Riley, 52 John, N. Y.
Cook R. & Sons, Winsted, Conn.	Fisher Joseph S., 41 Commerce, Phila.
Hochstetler Guy C., Field & Co., Brooklyn, E. D.	Rosen J. & Co., 150 E. 12th, N. Y.
Selton & Co., Auburn, N. Y.	Sanderson Bros. & Co., 15 Cliff, N. Y.
Wilson, Walker & Co., Pittsburgh, Pa.	Files, Manufacturers of.
Barn Door Hangers.	American File Co., Pawtucket, R. I.
Moore S. H. & E., Chicago, Ill.	Barnett O. & H., 41 and 43 Richmond, Phila.
Bed Screws.	Barnett O. & H., 41 and 43 Richmond, Phila.
Shelton Co., Birmingham, Conn.	Barnett O. & H., 41 and 43 Richmond, Phila.
Bellows, Manufacturers of.	Barnett O. & H., 41 and 43 Richmond, Phila.
Bullock T. H., Cleveland, O.	Barnett O. & H., 41 and 43 Richmond, Phila.
Newcomb Bros., 100 Chambers, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Scott Geo. M., Chicago, Ill.	Barnett O. & H., 41 and 43 Richmond, Phila.
Bells (Sleigh).	Barnett O. & H., 41 and 43 Richmond, Phila.
Berlin Bros. Mfg. Co., Easthampton, Conn.	Barnett O. & H., 41 and 43 Richmond, Phila.
Belted Leather, Makers of.	Barnett O. & H., 41 and 43 Richmond, Phila.
Alexander Bros., 33 Philadelphia.	Barnett O. & H., 41 and 43 Richmond, Phila.
Forepaugh Wm. F., Jr., & Bros., Philadelphia.	Barnett O. & H., 41 and 43 Richmond, Phila.
Bird Cages, Makers of.	Barnett O. & H., 41 and 43 Richmond, Phila.
Anderson A., 24 Pearl, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Maxheimer John, 27 and 29 Pearl, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Bit Braces, Manufacturers of.	Barnett O. & H., 41 and 43 Richmond, Phila.
Milners Falls Mfg. Co., 74 Chambers, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Blind Stamps.	Barnett O. & H., 41 and 43 Richmond, Phila.
Hall J. L., 81 John, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Blocks, Tackle, Makers of.	Barnett O. & H., 41 and 43 Richmond, Phila.
Burr & Co., 31 Fick Slip, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
McMillan Wm. H. & Co., 113 South, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Penfield Block Works, Lockport, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Penfield Tool Co. Providence, R. I.	Barnett O. & H., 41 and 43 Richmond, Phila.
Bolt Cutters.	Barnett O. & H., 41 and 43 Richmond, Phila.
Howard Iron Works, Buffalo, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Stockwell Screw and Machine Co., Cleveland, O.	Barnett O. & H., 41 and 43 Richmond, Phila.
Wiley & Russell, Greenfield, Mass.	Barnett O. & H., 41 and 43 Richmond, Phila.
Bolts (Corrugated Hel).	Barnett O. & H., 41 and 43 Richmond, Phila.
Wiley & Russell, Greenfield, Mass.	Barnett O. & H., 41 and 43 Richmond, Phila.
Bolts (Screw).	Barnett O. & H., 41 and 43 Richmond, Phila.
Eagle Bolt Works, Philadelphia.	Barnett O. & H., 41 and 43 Richmond, Phila.
Boat and Shoe Heel Stiffeners.	Barnett O. & H., 41 and 43 Richmond, Phila.
Lyons N., Albany, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Borns.	Barnett O. & H., 41 and 43 Richmond, Phila.
Coleman Wm. T. & Co., 130 Pearl, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Brass Bells, Makers of.	Barnett O. & H., 41 and 43 Richmond, Phila.
Tibout W. J., 202 Pearl, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Brass, Manufacturers of.	Barnett O. & H., 41 and 43 Richmond, Phila.
Ansonia Brass and Copper Co., 19 Cliff, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Bridgeport Brass Co., Bridgeport, Conn.	Barnett O. & H., 41 and 43 Richmond, Phila.
Brass Goods Mfg. Co., 27 Pearl, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Dayton John & Sons, 120 John, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Holmes, Booth & Haydens, 40 Chambers, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Manhattan Brass Co., 83 Reade, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Plume & Alwood Mfg. Co., 80 Chambers, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Scovill Mfg. Co., 421 Broome, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Waterbury Brass Co., 200 Broadway, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Brass Foundries.	Barnett O. & H., 41 and 43 Richmond, Phila.
Seaver Paul S., Philadelphia.	Barnett O. & H., 41 and 43 Richmond, Phila.
Bridge Builders.	Barnett O. & H., 41 and 43 Richmond, Phila.
Moseley Iron Bridge and Roof Co., 5 Day, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Buck Saws.	Barnett O. & H., 41 and 43 Richmond, Phila.
Boydton E. & Co., 80 Beekman, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Butcher and Shoe Knives, Manufacturers of.	Barnett O. & H., 41 and 43 Richmond, Phila.
Wilson John, Sheffield, England.	Barnett O. & H., 41 and 43 Richmond, Phila.
Butts and Hinges.	Barnett O. & H., 41 and 43 Richmond, Phila.
American Spiral Spring Butt Co., 80 Beekman, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Mason Mfg. Co., 115 Chambers, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Sabin Mfg. Co., Montpelier, Vt.	Barnett O. & H., 41 and 43 Richmond, Phila.
Simple & Birge Mfg. Co., St. Louis, Mo.	Barnett O. & H., 41 and 43 Richmond, Phila.
Stanley Works, New Britain, Conn.	Barnett O. & H., 41 and 43 Richmond, Phila.
Union Mfg. Co., 38 Chambers, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Calipers.	Barnett O. & H., 41 and 43 Richmond, Phila.
Victor Sewing Machine Co., Middletown, Conn.	Barnett O. & H., 41 and 43 Richmond, Phila.
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The Hoboken Coal Co., Jersey City, N. J.	Barnett O. & H., 41 and 43 Richmond, Phila.
Coal Hods.	Barnett O. & H., 41 and 43 Richmond, Phila.
Esteban, Wm. Philadelphia, Pa.	Barnett O. & H., 41 and 43 Richmond, Phila.
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Hotchkiss Sons, Bridgeport, Conn.	Barnett O. & H., 41 and 43 Richmond, Phila.
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Elshier Jos. S., 41 Commerce, Phila.	Barnett O. & H., 41 and 43 Richmond, Phila.
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Gould Company, Amherst, N. H.	Barnett O. & H., 41 and 43 Richmond, Phila.
Kraus & Hahn, 152 Center, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
Meriden Cutlery Co., Meriden, Conn.	Barnett O. & H., 41 and 43 Richmond, Phila.
Nauvoo Cutlery Co., 60 Chambers, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
New York Knife Co., Walden, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
The Pray Cutlery Co., Bridgeport, Conn.	Barnett O. & H., 41 and 43 Richmond, Phila.
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Van Wagner & Williams, 25 Beekman, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.
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Crane Bros. Mfg. Co., Chicago, Ill.	Barnett O. & H., 41 and 43 Richmond, Phila.
Mason Volney W. & Co., Providence, R. I.	Barnett O. & H., 41 and 43 Richmond, Phila.
Stokes & Parrish, Philadelphia, Pa.	Barnett O. & H., 41 and 43 Richmond, Phila.
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Rivet Buckets Co., Chicago, Ill.	Barnett O. & H., 41 and 43 Richmond, Phila.
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Leitch Valley Emery Wheel Co., Wetsport, Pa.	Barnett O. & H., 41 and 43 Richmond, Phila.
Engines, Machinists, &c.	Barnett O. & H., 41 and 43 Richmond, Phila.
Southern States Coal, Iron & Land Co., South Pittsburg, Tenn.	Barnett O. & H., 41 and 43 Richmond, Phila.
Tool Joseph C. & Marjory, N. Y.	Barnett O. & H., 41 and 43 Richmond, Phila.

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Baldwin Locomotive Works, Philadelphia, Pa.	Wood W. D. Co., Pittsburgh, Pa.
Engines, Steam.	Ironware.
Ervin Chas. W. & Co., Kensington, Phila.	Lalanc & Grosjean Mfg. Co., 80 Beekman, N. Y.
Farquhar A. B., York, Pa.	St. Louis Stamping Co., St. Louis, Mo.
Fitchburg Steam Engine Co., Fitchburg, Mass.	Lanterns, Manufacturers of.
Landis F. & A. B., Lancaster, Pa.	Diets R. E. (Tubular) 51 and 55 Fulton, N. Y.
Payne B. W. & Sons, Corning, N. Y.	Diets R. E. (Tubular) 51 and 55 Fulton, N. Y.
140 E. & W. B., Binghamton, N. Y.	Howard & Morse, 45 Fulton, N. Y.
Export Factors.	Lathe Dogs.
Jennings S. H., Deep River, Conn.	North Selden Co., Philadelphia.
McNab & Harlin Mfg. Co., 50 John, N. Y.	Lathes.
Penfield Block Works, Lockport, N. Y.	Johnson, Jr. Israel H. & Co., Philadelphia.
Faucets, Self-Measuring, Makers of.	Shepard H. L. & Co., Cincinnati, O.
Enterprise Mfg. Co. of Pa., Phila. and N. Y.	Lawn Mowers.
Feltz, Crane & Chapin, 31 & 33 Courtlandt, N. Y.	Mast, Foon & Co., Springfield, O.
Files, Importers of.	Lead Pipe, &c., Manufacturers of.
Carr J. & Riley, 52 John, N. Y.	Farrell & Co., Pittsburgh, Pa.
Fisher Joseph S., 41 Commerce, Phila.	Levels.
Rosen J. & Co., 150 E. 12th, N. Y.	Diston Henry & Sons, Philadelphia.
Sanderson Bros. & Co., 15 Cliff, N. Y.	Locks, Manufacturers of.
Files, Manufacturers of.	Bohannon Wilson, Broadway and Kossuth, Brook-
American File Co., Pawtucket, R. I.	lyn, E. D. & Co., New Albany, Ind.
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Barnett O. & H., 41 and 43 Richmond, Phila.	D. K. Stillier Lock Co., Philadelphia, Pa.
Barnett O. & H., 41 and 43 Richmond, Phila.	Edwards Hydraulic Works, Philadelphia, Pa.
Barnett O. & H., 41 and 43 Richmond, Phila.	Romer & Co., Newark, N. J.
Barnett O. & H., 41 and 43 Richmond, Phila.	Smith & Edge Mfg. Co., Bridgeport, Conn.
Barnett O. & H., 41 and 43 Richmond, Phila.	St. Louis Machine Co., St. Louis, Mo.
Barnett O. & H., 41 and 43 Richmond, Phila.	Machinery, Makers of.
Barnett O. & H., 41 and 43 Richmond, Phila.	Bliss & Williams, 107 Plymouth, Brooklyn.
Barnett O. & H., 41 and 43 Richmond, Phila.	Niles Tool Works, Hamilton, O.
Barnett O. & H., 41 and 43 Richmond, Phila.	Edwards Hydraulic Works, Philadelphia, Pa.
Barnett O. & H., 41 and 43 Richmond, Phila.	Pittsburgh Mfg. Co., Pittsburgh, Pa.
Barnett O. & H., 41 and 43 Richmond, Phila.	Pratt & Whitney Co., Hartford, Conn.
Barnett O. & H., 41 and 43 Richmond, Phila.	Sellers Wm. & Co., 40 Hamilton, Philadelphia.
Barnett O. & H., 41 and 43 Richmond, Phila.	The Bullard Machine Co., 14 Day, N. Y.
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Barnett O. & H., 41 and 43 Richmond, Phila.	Johnson & Co., Williamsburg, N. Y.
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Barnett O. & H., 41 and 43 Richmond, Phila.	Hammer & Co., Branford, Conn.
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Barnett O. & H., 41 and 43 Richmond, Phila.	N. Y. Handle and Mallet Works, 45 E. Houston.
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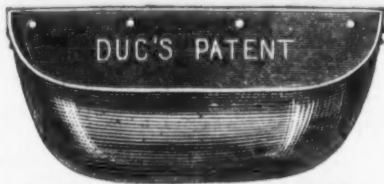
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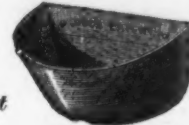
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PHILADELPHIA, 1876.



The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.



PHILADELPHIA, May 4th, 1877.

REPORT ON AWARDS.

Product, Files and Rasps.

Name and Address of Exhibitor, *Nicholson File Company,*
Providence, Rhode Island.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award for the following reasons, viz:

Being exceedingly well cut and of excellent material.

Daniel Steinmetz, of Pha.
Signature of the Judge.

APPROVAL OF GROUP JUDGES.

J. D. Imbogen, of Richmond, Va.
Chas. Staples, Jr., "Portland, Me.
G. L. Reed, "Clearfield, Pa.
J. Diefenbach, "Germany.
David McHardy, "Great Britain.

A true Copy of the record.

Francis A. Walker,
Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. Goshorn,
Director General.

J. R. Hawley,
President.

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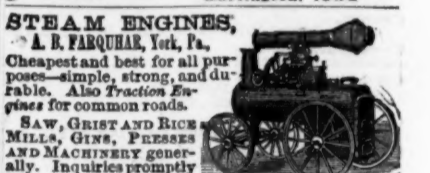
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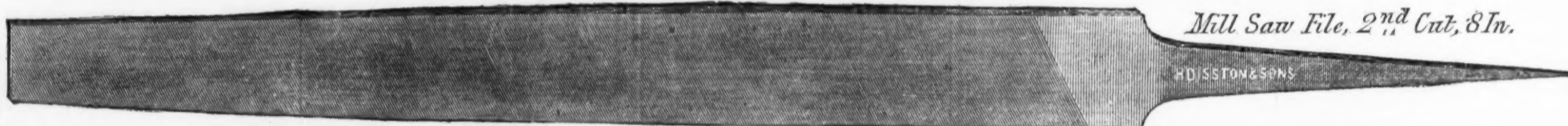


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Size,	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	Inch.
Price,	\$1 40	1 60	1 85	2 20	2 60	3 00	3 65	4 35	5 25	6 10	7 30	8 75	10 50	12 50	14 75	20 00	



Flat File, Bastard, 8 In.

Size,	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	Inch.
Price,	\$1 40	1 60	1 85	2 20	2 60	3 00	3 65	4 35	5 25	6 10	7 30	8 75	10 50	12 50	14 75	20 00	



Round File, Bastard, 8 In.

Size,	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	Inch.
Price,	\$1 40	1 60	1 85	2 20	2 60	3 00	3 65	4 35	5 25	6 10	7 30	8 75	10 50	12 50	14 75	20 00	



Four-Square File, Bastard, 8 In.

Size,	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	Inch.
Price,	\$1 40	1 60	1 85	2 20	2 60	3 00	3 65	4 35	5 25	6 10	7 30	8 75	10 50	12 50	14 75	20 00	



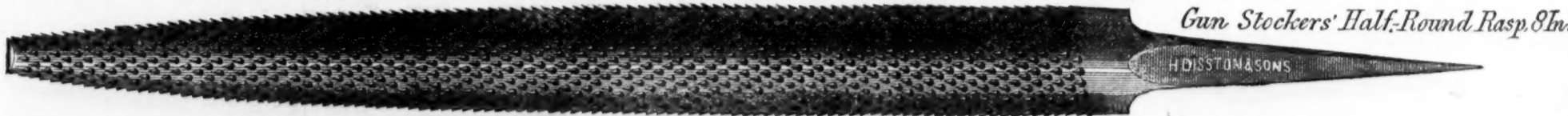
Hand Bastard, 8 In.

Size,	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	Inch.
Price,	\$1 60	1 90	2 25	2 65	3 10	3 60	4 25	5 00	5 75	6 75	8 00	9 50	11 25	13 25	15 50	22 00	



Half-Round Bastard, 8 In.

Size,	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	Inch.
Price,	\$1 60	1 90	2 25	2 65	3 10	3 60	4 25	5 00	5 75	6 75	8 00	9 50	11 25	13 25	15 50	22 00	



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15 X 30 to 24 X 36.....	12.25	10.75	9.75	8.75
20 X 28 to 24 X 36.....	13.00	11.50	9.75	8.75
20 X 37 to 26 X 44.....	14.50	13.25	10.75	9.75
20 X 40 to 30 X 50.....	15.00	14.00	11.25	10.25
30 X 52 to 30 X 54.....	15.62	14.50	12.00	11.00
30 X 56 to 34 X 60.....	17.25	15.50	13.00	12.00
31 X 50 to 34 X 60.....	16.25	15.25	13.00	12.00
30 X 60 to 40 X 60.....	20.75	18.75	17.25	15.75

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SIZES.	1st.	2d.	3d.	4th.
6 X 8 to 10 X 15.....	\$12.00	\$11.00	\$10.00	\$ 9.10
11 X 14 to 16 X 24.....	13.75	12.50	11.75	10.40
13 X 22 to 20 X 30.....	17.25	15.75	14.00	12.50
15 X 30 to 24 X 36.....	19.75	17.25	14.50	13.00
20 X 28 to 24 X 36.....	21.00	18.50	15.75	14.25
20 X 37 to 26 X 44.....	23.25	21.25	17.25	15.75
20 X 40 to 30 X 50.....	24.00	22.50	18.00	16.25
30 X 52 to 30 X 54.....	25.75	23.25	19.25	17.00
30 X 56 to 34 X 60.....	27.75	25.00	21.75	19.25
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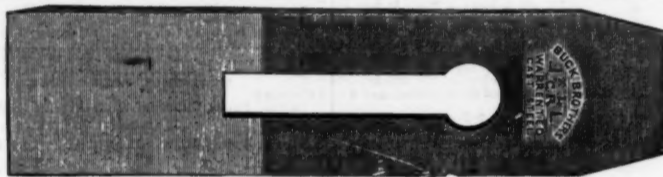
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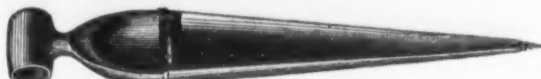
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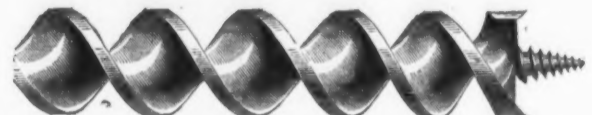
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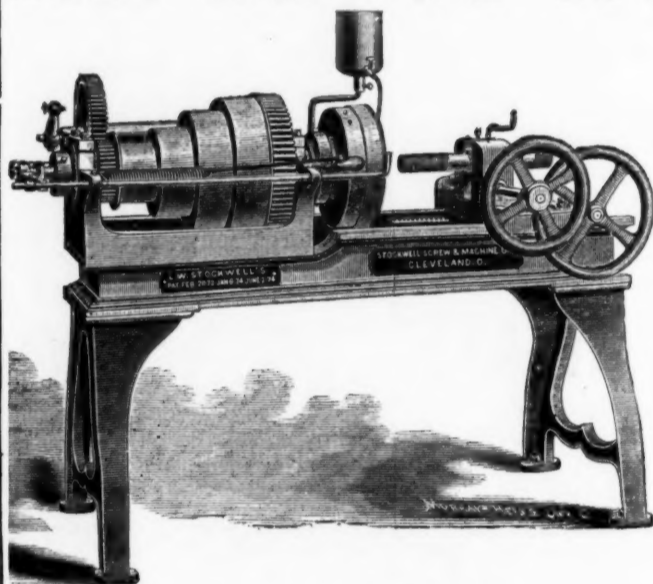
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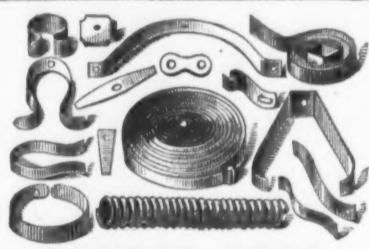
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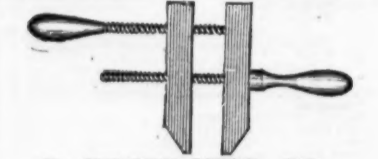
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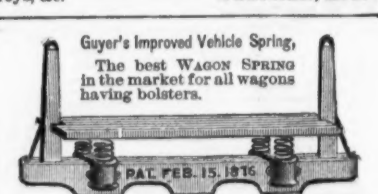
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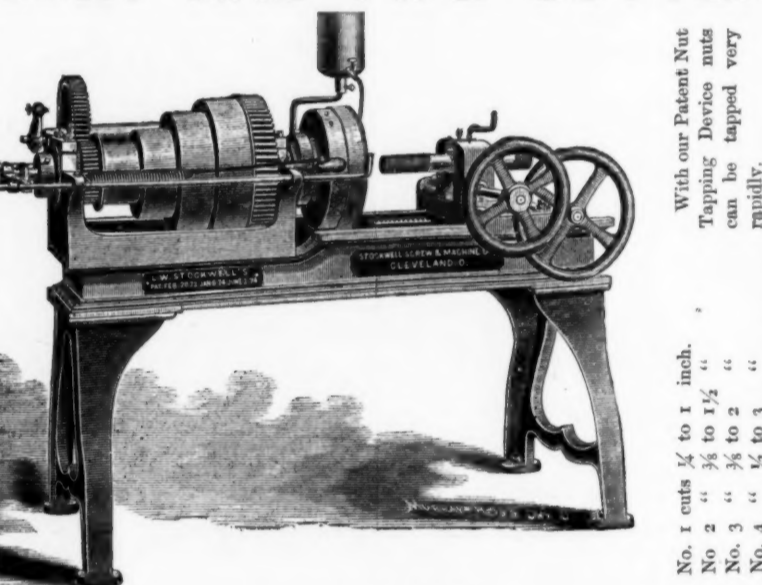
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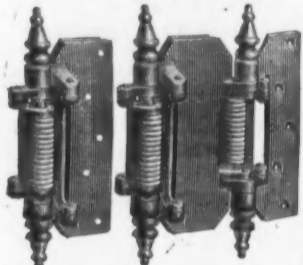
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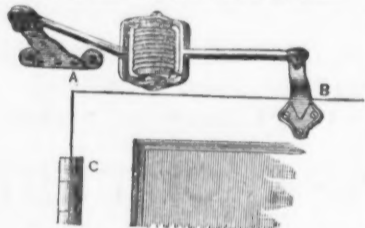
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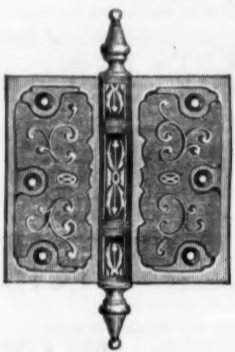
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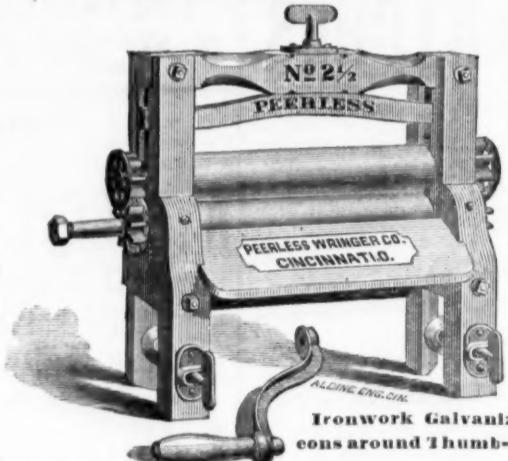
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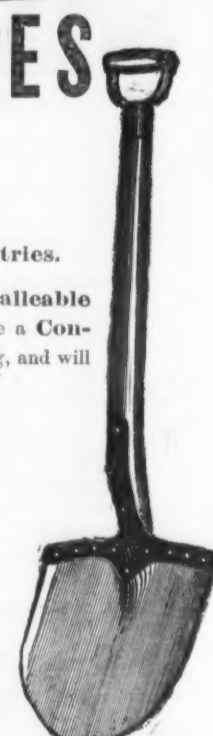
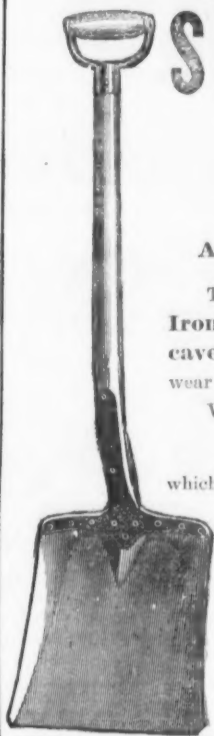
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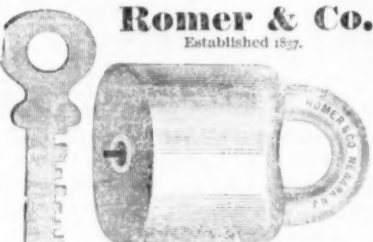
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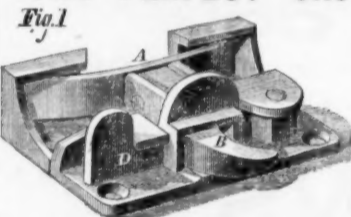
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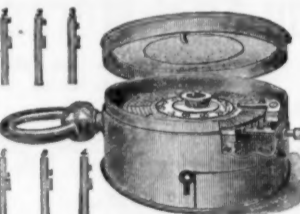
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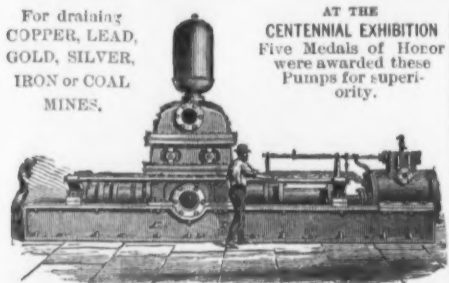
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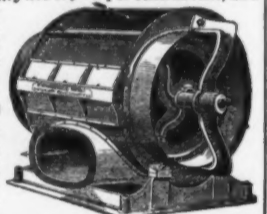
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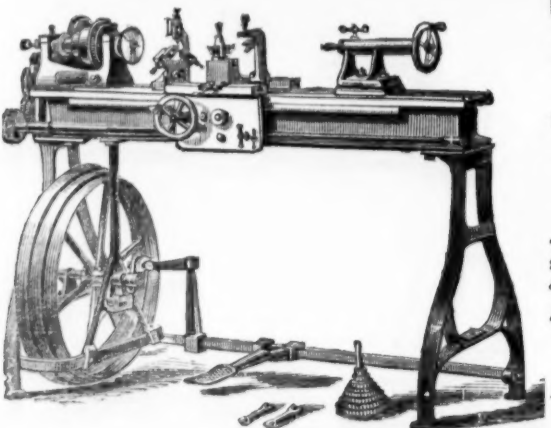
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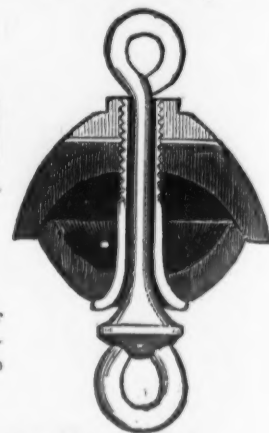
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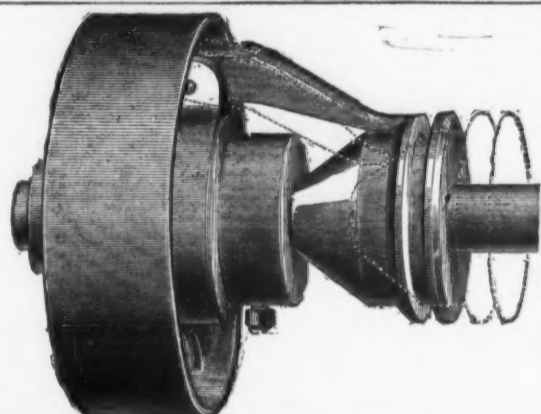
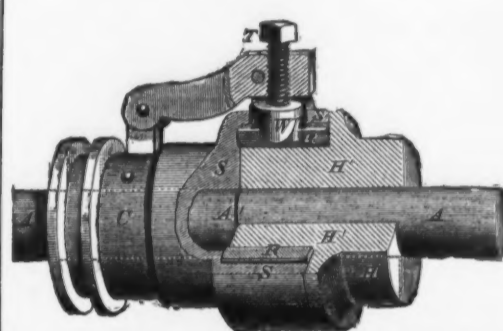
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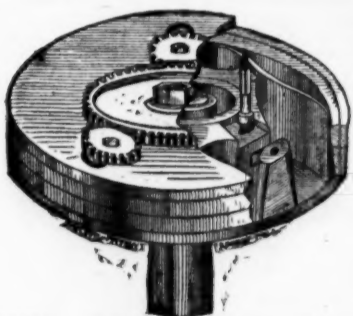
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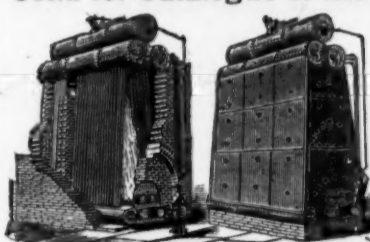
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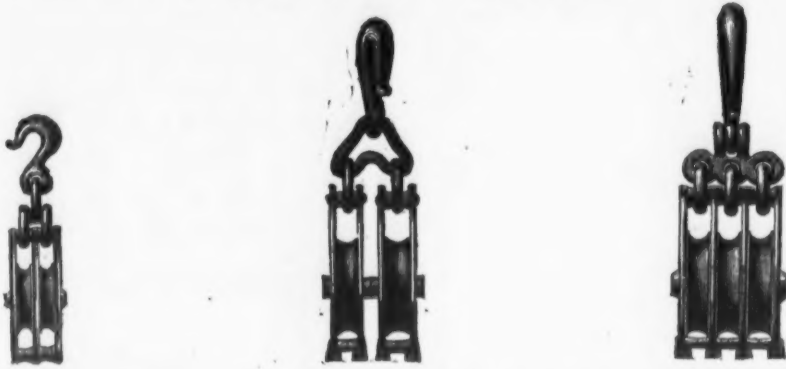
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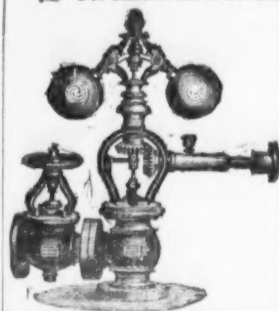
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5	45.00	51.00	3.75
5 1/2	50.00	57.00	4.25
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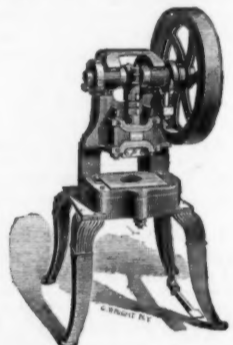
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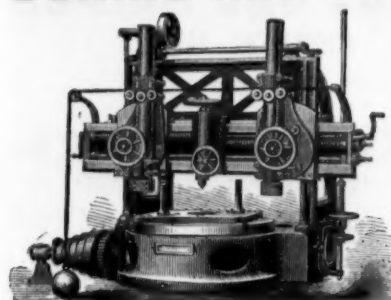
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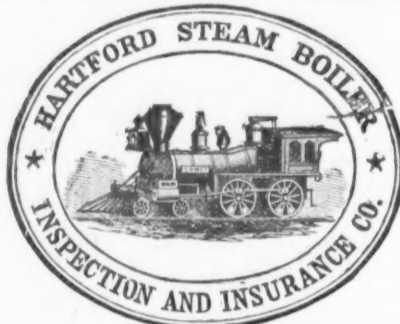
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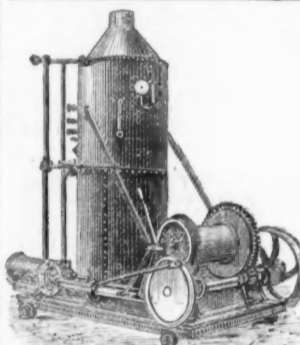
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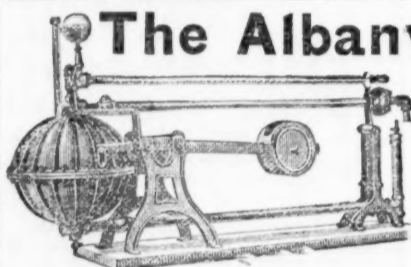
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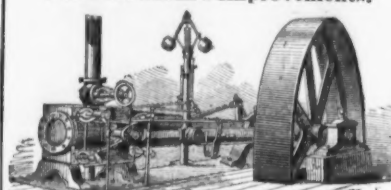
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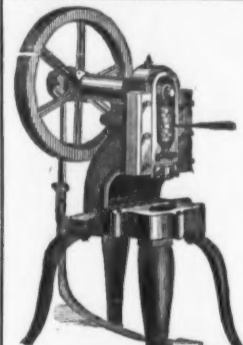
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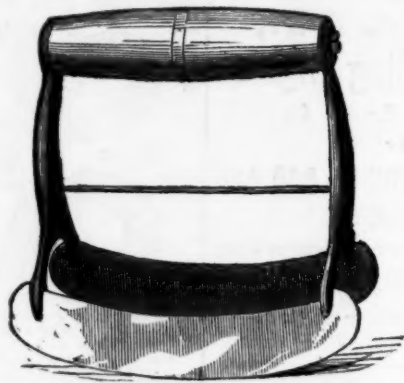
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PAT. MAR. 31, 1874

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GOOD COMIC CIRCULAR IN EACH BOX
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Special attention paid to packing for export trade; 2000 dozen sold in 1877. Price, \$4.50 per gross; one sample by mail, 10c; one each, 3 sizes, by mail, 20c; one dozen by mail, 60c. For sale by wholesale trade throughout the United States and Canada.

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From New Patterns.
NEW IMPROVEMENTS
STRONG AND POWERFUL
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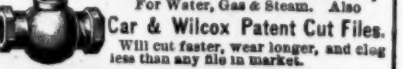
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FRICITION CLUTCHES
For connecting Shafting and Gearing.
Hoisting Machinery & Elevators, Shafting,
Hangers and Gearing.
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See cut of Elevator Hoisting Machine in issue of
Sept. 19, 1878, page 35.

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E. M. BOYNTON,

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First-Class Saws, Saw Frames, Cross-Cut Handles, Tools, Files, &c. Also Sole
Proprietor and Manufacturer of the Genuine Patent Lightning Saw.

80 BECKMAN STREET, NEW YORK.

TRIAL OF THE IMPROVED LIGHTNING SAW.

The Emperor Dom Pedro, accompanied by Director General Goshorn, Superintendent Albert, and others, visited Machinery Hall, at the Centennial on the evening of June 28th. Among other things inspected, at the invitation of E. M. BOYNTON, of New York, they witnessed a trial of the New Lightning Saw, patented March 26, 1876. Two men, with one of these saws, cut off a sound log of gum-wood, one foot extreme diameter, in seven seconds, or at the rate of a cord of wood in five minutes. Messrs. Corlies, Morell, Lynch, and other members of the commission witnessed the trial and timed the cutting. The Emperor remarked, That was fast, very fast cutting. Last evening the Emperor made another examination of the saw.—Philadelphia Press, June 30.

"BOYNTON'S SAWS were effectually tested before the judges at the Philadelphia Fair, July 6th and 7th. An ash log, eleven inches in diameter, was sawed off, with a four-and-a-half-foot lightning cross-cut, by two men, in precisely six seconds as timed by the chairman of the Centennial Judges of Class Fifteen. The speed is unprecedented, and would cut a cord of wood in four minutes. The representatives of Russia, Austria, France, Italy, Spain, Belgium, Sweden, England, and several other countries, were present, and expressed their high appreciation."

Received Medal and Highest Award of Centennial World's Fair, 1876.
\$1000 Challenge was prominently displayed for six months, and the numerous saw manufacturers of the world dared not accept it, or test in a competition so hopeless.

BAEDER, ADAMSON & CO.,

Manufacturers of SAND & EMERY PAPER & EMERY CLOTH.

(Also, in Rolls for machine work.)

Ground Emery, Corundum & Flint, Glue & Curled Hair, Hair Felt, & Felt
ing for Covering Boilers, Pipes, &c., Cow Hide Whips
Stores: PHILADELPHIA, 730 Market St., BOSTON, 143 Milk St.
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These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench, thus making a combination which has no equal.

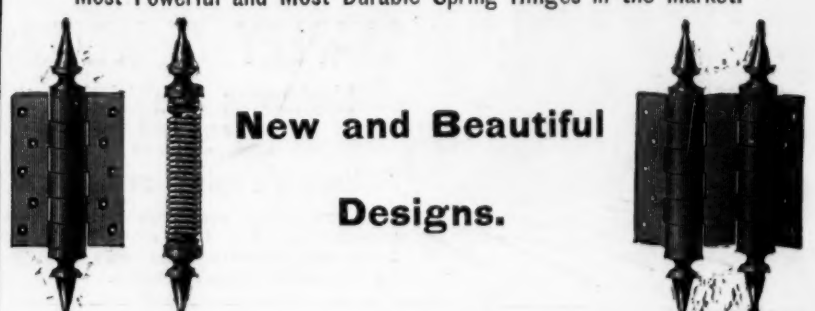
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GEM,

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The Iron Age

A Review of the Hardware, Iron and Metal Trades.

Publie chaque jeudi matin par DAVID WILLIAMS, No 83 Reade Street, New-York.

Edition pour l'Exportation.

New-York, Jeudi, 3 Octobre, 1878.

Abonnement par an frs 25.

La Bibliothèque de "IRON AGE."

B. 3. Section Américaine.
Exposition Universelle, Paris.

L'exhibition de l'iron age est d'un grand intérêt et d'une grande importance, soit pour les négociants européens en quincaillerie et produits métalliques, soit pour les représentants de l'industrie métallurgique visiteurs de l'exposition de 1878.

Elle se compose des documents et ouvrages suivants :

1,200 catalogues illustrés et prix-courants de fabricants américains de fer, acier, laiton et autres métaux.

850 photographies de fabriques et articles fabriqués américains.

50 atlas et cartes montrant le caractère des ressources naturelles des Etats-Unis et la manière dont elles sont distribuées.

500 volumes embrassant toutes les publications classiques américaines portant sur la métallurgie, la minéralogie, la géologie, les arts mécaniques, &c.

Cette bibliothèque comprend tout ce qui a pu être réuni de documents portant sur les gisements, les systèmes de réduction, la statistique de l'étendue et de la production du fer, de la houille, du cuivre, zinc, or, argent, pétrole et autres minéraux ou dérivés de minéraux industriels et précieux. Elle renferme en outre les prix-courants et catalogues, les photographies et lithographies représentant les usines, fabriques et produits de plus de 1,000 maisons américaines s'occupant de la fabrication de la quincaillerie, des poêles, articles métalliques, appareils mécaniques, &c.

Elle représente chaque branche d'industrie américaine qui s'occupe de la production d'articles composés en tout ou en partie d'éléments métalliques.

Les fabricants de quincaillerie américains ont acquis une certaine célébrité par l'élegance qui distingue leurs prix-courants et catalogues. On y trouve généralement une profusion de clichés admirablement dessinés et exécutés, et nous nous empressons de prêter notre concours aux personnes appartenant à cette branche d'affaires en Europe, soit en mettant notre bibliothèque à leur disposition, soit en leur donnant tous les renseignements qu'elles désireraient ; nous leur faisons à ce titre l'offre de nos services.

L'exposition de notre bibliothèque a pour but de représenter le commerce américain en général et non de servir de réclame à notre établissement.

Ce recueil de livres, &c., est le produit exclusif des soins et des dépenses de l'exposant ; aucune autre personne n'y a contribué en quoi que ce soit ; le travail de collection et les frais d'exhibition nous sont absolument personnels.

Les visiteurs à qui notre bibliothèque ou une partie quelconque de cette collection serait de quelque intérêt, auront toute facilité de s'en servir.

DAVID WILLIAMS,
Editeur.

Revue Mensuelle du Marché de Quincaillerie.

Malgré la triste période que traverse une section de notre pays par suite des ravages que cause la fièvre jaune, les affaires y étant presque complètement paralysées, les transactions en quincaillerie en général pendant le mois de Septembre ont causé une surprise agréable aux fabricants et aux négociants de la ville, et les seules plaintes formulées aujourd'hui proviennent des maisons qui ont un grand commerce avec les Etats du Sud. La demande de presque tous les articles de quincaillerie destinés à approvisionner les Etats du Centre et de l'Ouest a dépassé le chiffre ordinaire des affaires de la saison. Il faut attribuer cette activité exceptionnelle d'abord aux taux extrêmement bas auxquels s'écoulaient actuellement à peu près toutes les espèces de marchandises, ensuite à l'impression qui semble prévaloir assez généralement que tout changement de prix dans un avenir rapproché favorisera plutôt une plus-value qu'une dépréciation plus prononcée. Un autre motif d'ajouter foi à ce qui vient d'être dit est que partout aux Etats-Unis les stocks de marchandises existant en magasin ont été réduits aux proportions les plus minimes, conséquence de la baisse non interrompue qui a prévalu pendant plusieurs années.

L'activité à laquelle nous venons de faire

allusion a été exempte de tout mouvement spéculatif, bien qu'il ait été affirmé que des commandes de vis pour bois de quelque importance aient été exécutées durant le mois et que la fabrication ait dépassé les besoins. Le vil prix auquel ce genre de marchandises a été abaissé est certainement de nature à attirer l'attention des spéculateurs ; mais d'un autre côté il ne faut pas perdre de vue que les fabricants de cette espèce de marchandises se disputent les ordres et que les principaux producteurs de vis peuvent être amenés d'un moment à l'autre à offrir à l'encan sans réserve leur excédent de production. Même au taux actuel nous ne saurions guère nous persuader qu'un bénéfice quelconque pourrait résulter d'achats spéculatifs semblables. Nous cotons les vis en fer pour bois, à tête plate, à un exempté de 70 pour cent sur la liste normale et à ce prix le marché demeure fermement soutenu.

Les clous ont joui d'une demande suivie à des chiffres faibles, favorisant les acheteurs. Dans notre numéro du 12 Sept., nous avons annoncé la faillite de la fabrique de clous "The Oxford Iron Co." C'est une des principales fabriques de clous coupés aux Etats-Unis, mais cet événement n'a eu que peu d'effet sur le marché. L'administration de cette fabrique a été confiée à un gérant dont le but est de rendre l'exploitation de l'usine au profit de créanciers aussi fructueuse que possible. On ne croit donc pas que le produit de cette usine sera jeté sur le marché d'une façon déraisonnable ou que l'administrateur suivra une ligne de conduite qui se départirait d'une entente harmonieuse avec les fabricants de clous associés des Etats Atlantiques. Le taux nominal des clous de rod. à 601. n'a pas varié durant le mois de \$2.20 les 100 livres, mais les acheteurs ont placé leurs commandes sur la base de \$2.15 net. Nous cotons, à la clôture, les clous de rod. à 601., de \$2.15 à \$2.20 net, selon qualité.

La fabrique Russell & Erwin Manufacturing Co. et Messrs. Sargent & Cie ont publié des prix-courants avec escomptes modifiés au début du mois. Nos lecteurs se rappelleront que nous annonçâmes lors de notre dernière revue mensuelle les changements survenus dans le temps. Les listes publiées par ces maisons ne contiennent donc que peu de chose qui ne leur fût familier.

Le nombre des nouveautés offertes dans le marché durant le mois a été moindre que ce que ce qui a lieu ordinairement et en ce qui a rapport aux changements il n'y a eu rien qui vaille la peine d'être signalé.

Le mois clôture au milieu de demandes actives pour presque tous les genres de quincaillerie à des taux soutenus.

Fer.

Le chiffre d'affaires qui s'est fait en fonte brute dans le courant du mois de Septembre a été tout à fait insignifiant, et le commerce se trouve dans un état aussi peu satisfaisant que possible. Presque toutes les transactions signalées ces jours derniers ont été surchargées de conditions tellement gênantes, tant sous le rapport du taux que du crédit alloué, qu'elles ont été entourées du plus grand mystère et toutes les fois qu'on s'enquiert du prix, on reçoit invariablement cette réponse : "à des conditions particulières." A vrai dire, à la seule exception de quelques marques privilégiées de fonte de Lehigh, qui se sont fermement tenues, toutes les cotes courantes imprimées peuvent être considérées comme nominales. De temps en temps nous sommes informés d'une vente de quelques centaines de tonnes de fer d'excellente qualité à des taux tellement bas que, sans une confirmation au-dessus de tout doute (difficile à se procurer) il serait évidemment imprudent d'en faire mention, mais comme de semblables rumeurs deviennent quotidiennement plus fréquentes, nous avons la conviction que le bon fer peut être acheté à des taux, qui, nous le croyons, ne couvrent pas le prix de revient. Les ventes de fonte américaine de toute qualité annoncées dans le marché New-Yorkais pendant le mois atteignent le chiffre de 11,750 tonnes seulement, mais il y a eu indubitablement beaucoup de transactions faites en sous main qui augmenteraient cet ensemble d'une façon notable si on en connaissait le chiffre. Vers la fin du mois il y a eu un semblant de reprise provoqué par des demandes de prix arrivées pendant les derniers jours et qui nous font supposer que nous sommes à la veille de quelques acquisitions importantes. Nous cotons nominalement la fonte de moulage No. 1 de \$16.50 à \$18.50 ; la fonte de moulage No. 2 de \$15.50 à \$16.50 et le fer doux de forge de \$14.50 à \$15.50.

Les demandes de fonte écossaise ont été

faibles et l'ensemble des ventes au mois de Septembre ne dépasse pas 700 tonnes. Les fontes suivantes sont vendues, par petits lots, couramment, aux prix suivants : Glengarnock à \$23.75, Eglinton à \$22.75 et Coltness à \$24.

Les rails d'acier sont quelque peu recherchés, mais comme les acheteurs exigent généralement que la livraison suive immédiatement la commande, il n'y a que peu d'ordres agréés par les laminiers dont la capacité de production est mise sévèrement à l'épreuve. Le total des ventes de rails d'acier que nous avons pu annoncer dans le courant du mois est de 11,200 tonnes. Ce chiffre serait bien autrement grand, si les commandes pouvaient être effectuées avec plus de promptitude. L'extrême rareté des rails d'acier a engagé les acheteurs qui ont des besoins urgents à s'enquérir du taux des rails de fer et l'on nous assure que plusieurs demandes de prix ont été signalées ces jours derniers sans toutefois aboutir encore, paraît-il, à des transactions effectives. Nous cotons les rails d'acier livrables à l'usine de \$43 à \$44, et les rails de fer, selon qualité, et conditions de paiement, &c., de \$32 à \$36.

Il n'y a pas un bien grand mouvement à signaler sur les vieux rails. Les ventes effectuées dans le courant du mois n'excèdent pas 3000 tonnes. Le taux nominal des vieux rails est de \$17 à \$18 la tonne rendue à New-York. Les débris de fer sont cotés de \$20 à \$21, la tonne, fer forgé No. 1, pris au magasin du vendeur à New-York. Les ventes totales des quatre semaines écoulées se chiffrent par un ensemble d'environ 1100 tonnes.

Métaux.

Bien que les affaires en général se soient un peu ranimées depuis notre dernière revue mensuelle, les métaux sont demeurés assez calmes. Les vendeurs et consommateurs semblent vouloir persister dans leur politique de n'acheter qu'au fur et à mesure de leurs besoins immédiats, et les taux exceptionnellement bas ne les séduisent pas. Il en a été de même en Europe où les revendeurs n'opèrent qu'en hésitant. Le marché des métaux des deux côtés de l'Océan semble donc assez éloigné de l'époque de revirement qu'on avait fait miroiter à nos yeux lors du règlement de la question d'Orient. Selon toute vraisemblance il faudra patienter jusqu'au printemps prochain avant qu'une amélioration sensible s'empare d'une situation encore quelque peu compromise. Il y a tout lieu de croire, cependant, que ce revirement se fera sentir aux Etats-Unis plus tôt qu'en Europe, vu les éléments essentiellement sains sur lesquels repose notre commerce à l'intérieur par suite de l'abondance des récoltes de l'année dernière et de celle-ci. Cette abondance existe à peu près partout, y compris le sud qui, malgré le désarroi momentané dans lequel il a été plongé par les ravages de la fièvre jaune, se relèvera vite de ce malaise. Comme au mois de Septembre 1873 nous avons été les premiers à élever le cri d'alarme, nous avons la ferme conviction que l'ère d'une prospérité renaissante sera inaugurée de ce côté de l'Océan dans un avenir assez prochain. Jusqu'à quel degré et à quelle époque les métaux bénéficieront de la situation dépend d'une foule de circonstances que nous ne pouvons apprécier aujourd'hui, mais il est clair que la valeur intrinsèque des métaux y jouera le rôle le plus important. Personne ne niera qu'aux taux actuels nous y touchons d'assez près.

Cuivre.—Au commencement du mois dernier il y a eu quelque velléité d'une reprise, et les propriétaires des mines ont déployé une raideur extrême ; quelques fabricants de laiton ont fait des achats plus importants et plusieurs lots de cuivre du Lac Supérieur ont été enlevés à 16 1/2¢. Ce taux n'a pu être maintenu à l'époque où la demande pour la consommation s'affaiblissait et les taux ont été aussitôt ramenés au chiffre le plus bas, clôturant à 16¢. Le tableau suivant donnera une idée de la dépréciation extraordinaire qui a eu lieu depuis 1872 :

	1873.	1874.	1875.	1876.	1877.	1878.
Janvier.....	35	26	23 1/2	23	19 1/2	17 1/2
Février.....	34 1/2	25	22 1/2	22 1/2	19	17 1/2
Mars.....	34	24 1/2	21 1/2	21 1/2	18 1/2	17 1/2
Avril.....	34	25	22 1/2	22 1/2	18 1/2	17 1/2
Mai.....	32 1/2	25	22 1/2	22 1/2	18 1/2	16 1/2
Juin.....	29 1/2	24 1/2	23	20 1/2	19 1/2	16 1/2
Juillet.....	28 1/2	24	23	20 1/2	19 1/2	16 1/2
Sept.....	27	21 1/2	21 1/2	19 1/2	18	16 1/2
Oct.....	24 1/2	21 1/2	21 1/2	21	17 1/2	16 1/2
Nov.....	24 1/2	21 1/2	21 1/2	20 1/2	17 1/2	16 1/2
Déc.....	24 1/2	21 1/2	21 1/2	20	17 1/2	16 1/2

D'après des dépêches reçues par le câble, de Valparaiso, les rapports entre le Chili et la République Argentine sont entrés dans une phase menaçante qui pourrait bien aboutir à une guerre entre ces deux pays, mais comme le sujet en litige s'est produit à

plusieurs reprises, depuis une vingtaine d'années, il faut croire que leur épuisement financier conseillera le maintien de la paix et que le cuivre ne subira pas d'influences de ce genre.

Etain.—Ce métal est descendu au mois de Septembre au taux le plus bas auquel il soit tombé depuis trente ans environ, celui du Détroit ayant touché \$56 à Londres et 13 1/2¢ ici. Cette débâcle sans précédent a été occasionnée par l'excès des expéditions australiennes en Angleterre. Plus avant dans le mois, quelques faibles détenteurs ont vendu leur stock et le marché s'est aussitôt relevé, sympathisant avec la réaction favorable qui avait lieu à Londres en même temps. Voici les cours de l'étain du Détroit à New-York depuis l'année 1876 :

	1877.	1878.
Janvier.....	de 16 1/2 à 17 1/2	de 14 1/2 à 15 1/2
Février.....	16 1/2 à 17 1/2	14 1/2 à 14 3/4
Mars.....	16 1/2 à 17 1/2	14 1/2 à 14 3/4
Avril.....	16 1/2 à 17 1/2	14 1/2 à 14 3/4
Mai.....	16 1/2 à 17 1/2	14 1/2 à 14 3/4
Juin.....	16 1/2 à 17 1/2	14 1/2 à 14 3/4
Juillet.....	15 1/2 à 16 1/2	14 1/2 à 14 3/4
Sept.....	15 1/2 à 16 1/2	13 1/2 à 13 3/4
Oct.....	15 1/2 à 16 1/2	13 1/2 à 13 3/4
Nov.....	15 1/2 à 16 1/2	13 1/2 à 13 3/4
Déc.....	15 1/2 à 16 1/2	13 1/2 à 13 3/4

Fer-blanc.—Contre toute attente, cet article a été peu recherché malgré les taux peu élevés qu'il a atteints, et en dépit du stock réduit à New-York. La baisse à laquelle le fer-blanc a été en butte ici depuis la panique de 1873, sautera aux yeux en étudiant le tableau suivant :

MARQUES ORDINAIRES, PAR CAISSE, EN OR.	
Juillet 1, 1874.	
Charcoal Bright.....	de \$10.35 à \$10.50
" Termes.....	de 9.00 à 9.50
Coke Tin.....	de 8.00 à 8.25
" Termes.....	de 7.00 à 7.75
Moyenne.....	\$8.71
Avril 28, 1876.	
Charcoal Bright.....	de \$7.00 à \$7.37 1/2
" Termes.....	de 6.75 à 7.00
Coke Tin.....	de 6.12 1/2 à 6.37 1/2
" Termes.....	de 5.37 1/2 à 5.50
Moyenne.....	\$6.58
Mai 1, 1877.	
Charcoal Bright.....	de \$6.62 1/2 à \$6.75
" Termes.....	de 5.87 1/2 à 6.00
Coke Tin.....	de 5.75 à 5.87 1/2
" Termes.....	de 5.37 1/2 à 5.50
Moyenne.....	\$5.97
Sept. 7, 1877.	
Charcoal Bright.....	\$6.62 1/2
" Termes.....	6.12 1/2
Coke Tin.....	5.75
" Termes.....	5.50 1/2
Moyenne.....	\$6.00

En Juin la moyenne tomba à \$5.35 ; en Juillet à \$5.33 ; elle est maintenant de \$5.18. C'est une baisse en quatre ans d'à peu près 40 %.

La consommation du Fer-blanc est exceptionnellement grande aux Etats-Unis, depuis quelque temps, et il y a tout lieu de croire que cet article se trouve dans une position excellente sans que l'on ait à craindre une dépréciation importante ultérieure, pas plus en Angleterre qu'à New-York.

Plomb.—Les principaux détenteurs ont fait des efforts soutenus pour maintenir les prix, mais tous ont été vains ; les arrivages ont dépassé les besoins courants et les consignataires n'ont pas les mettre en magasin, ils en ont livré aux quelques demandes pour la consommation à des taux de plus en plus faibles, ramenant le prix de 3.45¢ au début du mois à 3.30¢ à sa clôture. Le cours des prix en Europe a été également chancelant et il n'y a rien qui fasse entrevoir une réaction favorable prochaine, ni en Europe, ni ici. Voici les cours du plomb ordinaire à New-York depuis l'année 1876, en quintaux de 100 livres :

	1877.	1878.
Janvier.....	de \$6.15 à \$6.30	de \$4.25 à \$4.00
Février.....	6.30 à 6.40	3.87 1/2 à 3.50
Mars.....	6.30 à 6.40	3.62 1/2 à 3.80
Avril.....	6.40 à 6.45	3.80 à 3.62 1/2
Mai.....	6.00 à 5.55	3.62 1/2 à 3.25
Juin.....	5.60 à 5.70	3.20 à 3.12 1/2
Juillet.....	5.37 1/2 à 5.25	3.62 1/2 à 3.20
Sept.....	5.00 à 4.00	3.35 à 3.45
Oct.....	4.75 à 4.62 1/2	3.45 à 3.30
Nov.....	4.50 à 5.00	.....
Déc.....	4.50 à 4.37 1/2	.....

Zinc.—Le zinc américain ordinaire avait depuis quelque temps repris la voie ascensionnelle sous l'impulsion d'une production quelque peu réduite et une bonne demande pour la consommation, mais celle-ci s'étant ralentie un peu, ce métal est rentré dans le calme, les taux rétrogradant un peu. Débutant au prix de 5¢ à 5 1/2¢, il clôture de 4 7/8¢ à 5¢. Le tableau suivant donne les détails des fluctuations à New-York depuis l'année 1876 :

	1877.	1878.
Janvier.....	de 6 1/2 à 6 3/4	de 5 1/2 à 6
Février.....	6 1/2 à 6 3/4	5 1/2 à 5 3/4
Mars.....	6 1/2 à 6 3/4	5 1/2 à 5 3/4
Avril.....	6 1/2 à 6 3/4	5 1/2 à 5 3/4
Mai.....	6 1/2 à 6 3/4	5 1/2 à 5 3/4
Juin.....	5 1/2 à 6 1/2	4 1/2 à 5
Juillet.....	5 1/2 à 6 1/2	4 1/2 à 5
Sept.....	5 1/2 à 6 1/2	4 1/2 à 5
Oct.....	5 1/2 à 6 1/2	4 1/2 à 5

Sept..... 5 1/2 à 6 1/2 4 1/2 à 5
Oct..... 5 1/2 à 6 1/2 4 1/2 à 5
Nov..... 5 1/2 à 6 1/2 4 1/2 à 5
Déc..... 5 1/2 à 6 1/2 4 1/2 à 5

Nickel.—Les dépêches de la Nouvelle Calédonie n'ont pas influé sur la valeur du nickel, lequel a été modérément recherché de \$1.05 à \$1.30.

Antimoine.—Ce produit est redevenu plus calme, sans que pour cela les prix aient fléchi. Il n'a pas varié de 12¢ à 12 1/2¢. Londres tient ferme de \$50 à \$52.

Statistique Commerciale.

Nous extrayons des statistiques officielles du gouvernement les articles qui intéressent plus spécialement nos lecteurs :

Exportation de produits américains.—En milliers de dollars.

Année fiscale finissant le 30 Juin.	1878.		1877.	
	Quantité.	Val'r.	Quantité.	Val'r.
Emoteurs.....	2	.....	41	.....
Moulin à che- vaux.....	30	.....	24	.....
Faucheuses.....	1,019	.....	765	.....
Charrues.....	155	.....	129	.....
Autres inst. ar. Tn.....	1,379	.....	887	.....
Cloches.....	111	.....	67	.....
Cirages.....	105	.....	102	.....
Articles en laiton.....	589	.....	328	.....
Briques réfr.....	254	.....	172	.....
Brosses.....	146	.....	172	.....
Bougies.....	219	.....	234	.....
Voitures.....	979	.....	866	.....
Wagons.....	538	.....	339	.....
Pendules.....	936	.....	1,008	.....
Houille, tonn. Cwt.....	660,138	2,359	740,430	2,916
Mineral de cuivre, cwt.....	32,947	169	21,432	109
Cuivre, barres, lbs.....	11,297,876	2,102	13,461,563	2,718
Articles en cuivre.....	217	.....	196	.....
Cor dage, lbs.....	3,411,394	386	2,554,899	324
Poterie.....	98	.....	87	.....
Verrerie.....	59	.....	27	.....
App. à gaz.....	870	.....	618	.....
Cuivre.....	31	.....	16	.....
Cables de chan- vre.....	146	.....	176	.....
Art. en caout- chouc.....	305	.....	219	.....
Fonte, cwt.....	115,633	140	63,601	89
Fer en barres, cwt.....	50,393	133	59,622	195
Tôle, cwt.....	2,100	12	2,611	14
Rails, cwt.....	164,769	395	105,281	244
Feuillards.....	2,480	13	4,989	22
Pièces moulées Roues de wag- on.....	276	.....	218	.....
Poêles.....	6,316	69	7,657	122
Locomotives, nombre.....	141	.....	113	.....
Machines fixes, nombre.....	98	1,017	53	569
Chaudières.....	103	120	53	54
App. mécan.....	3,850	.....	2,698	.....
Clous et cram- pons, lbs.....	1,498,603	288	9,316,659	320
Autres art. en fer.....	3,988	.....	3,362	.....
Acier en lingots et en barres, lbs.....	156,050	16	140,686	16
Coutellerie.....	35	.....	30	.....
Outils tranch- ants.....	911	.....	721	.....
Limes et acies. Armes à feu.....	40	.....	36	.....
Autres articles en acier.....	2,099	.....	5,400	.....
Lampes.....	365	.....	307	.....
Articles en plomb.....	245	.....	243	.....
Maroquin.....	315	.....	50	.....
Cuir tanné, lbs.	904	.....	1,280	.....
Sellerie.....	6,189	25,122,936	6,016	.....
Pétrole, gall. Huile à lubri- fier, gall.....	286,214,541	41,514	269,441,841	55,401
Huile de sain- doux, gall.....	2,304,379	639	1,601,065	498
Canons.....	1,651,648	994	347,305	282
Cartouches.....	3,357	.....	12	.....
Poudre, lbs.....	527,753	102	1,317,611	249
Projectiles, lbs.	4,559,137	1,367	7,799,122	2,162
Minerai argen- tif, cwt.....	802	9	3,229	45
Peinture.....	239	.....	186	.....
Argenterie.....	215	.....	150	.....
Presses à impr- mer et types.....	171	.....	160	.....
Mercurie, lbs.....	2,552,388	210	3,894,311	1,707
Balances.....	2,210	.....	159	.....
Mach. à coudre	1,662	.....	1,652	.....
Essence de thé- reb., gall.....	7,633,668	2,334	6,796,927	2,275
Pomp. à feu.....	30	.....	62	.....
Articles en fer- blanc.....	116	.....	87	.....
Malles.....	140	.....	131	.....
Vernis, gall.....	60,810	93	40,405	61
Vapeurs, tonn. Voliers.....	2,817	148	48	9
Montres.....	7,992	242	5,997	187
Bois et art. en bois.....	141	.....	78	.....
Oxyde de zinc, cwt.....	16,780	.....	18,439	.....
Fonte, lbs.....	16,050	84	6,428	34
Zinc, lbs.....	2,545,320	217	1,419,922	115
Autres march.....	572,821	.....	467,5	.....
Total.....	.....	680,684	.....	580,676

